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A DISCUSSION CONCERNING

THE RATIONAL USE OF LIME ON THE FARM

CONTAINING A

REVIEW OF EXTENSION CIRCULAR, No. 24

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A DISCUSSION CONCERNING THE RATIONAL USE OF LIME ON THE FARM

CONTAINING A
REVIEW OF EXTENSION CIRCULAR, No. 24

INTRODUCTORY REMARKS BY THE COMMISSIONER OF AGRICULTURE

To the People of North Carolina:

At my request, the Agronomist of the Department of Agriculture, Prof. James L. Burgess, prepared in 1915 Circular, "*Lime Facts for Landowners*," and in 1916 Bulletin, No. 220, "*Relation of Calcium Carbonate (Ground Limestone and Marl) in the Soil to Acid Phosphate and the Soil Phosphates*," and I approved them for publication. The latter of these publications was distributed as the May BULLETIN of the Department of Agriculture.

In September, 1916, the United States Experiment Station at West Raleigh published, with the approval of the Director, Extension Circular, No. 24, "*How to Use Lime on the Farm*," which controverts many of the leading statements made in the above named publications written by Mr. Burgess under my direction.

I deem it expedient, therefore, to publish the following bulletin, as, in part, a reply to Extension Circular, No. 24, in order that the farmers may have an opportunity to weight the arguments on both sides of the question and decide for themselves whose advice is more nearly correct, and more nearly in accord with the farming interests of the State. The bulletin contains a congratulatory letter from Nathaniel P. Pratt, proprietor of the N. P. Pratt Commercial Chemical Laboratory of Atlanta, Ga., the leading laboratory of the kind in the South. Dr. Pratt is, moreover, considered one of the very best authorities on commercial fertilizers in the United States. The bulletin also contains a brief review of Extension Circular, No. 24, together with numerous collations of evidence and citations of authorities in support of the position taken by the Commissioner of Agriculture concerning the rational use of lime on the farm. The whole of this bulletin was prepared by Mr. Burgess, at my request, and carefully reviewed by me before going to press.

Respectfully,
W. A. GRAHAM,
Commissioner of Agriculture.

PROFESSOR BURGESS' LETTER IN REPLY TO COMMISSIONER
GRAHAM'S LETTER OF REQUEST

RALEIGH, N. C., November 30, 1916.

HON. W. A. GRAHAM,
Commissioner of Agriculture,
Raleigh, N. C.

DEAR SIR:—In compliance with your request of the 16th inst., I am handing you herewith a paper containing a discussion of the statements found in Extension Circular, No. 24, issued by the United States Experiment Station at West Raleigh and approved by the Director of Extension Service.

I have made an especial effort to be entirely just to the above named circular, but, at the same time, to point out some of the errors and fallacies in its arguments and the inevitable effect of its teaching on the agricultural interests of the State. Though a few unfamiliar terms may have been used, an effort has been made to clothe the discussion in the simplest and most understandable language the nature of the subject will permit.

Very truly yours,

JAMES L. BURGESS,
State Agronomist.

INTRODUCTORY REMARKS BY THE STATE AGRONOMIST

In the fall of 1913 the price of cotton ranged around 14 cents a pound. In August, 1914, the European war broke out, and, as the result of this war, the price of cotton dropped almost suddenly from 14 to 6.2 cents a pound. The farmers had purchased fertilizers in the spring of 1914 on the basis of 10- to 15-cent cotton in the fall. But when fall came, with the disastrous drop in the price of lint, they found themselves not only without sufficient funds to pay the fertilizer bills made the previous spring, but, also, without funds with which to purchase fertilizers for the crop of 1915, even though no advance in the prices of fertilizer should occur. But very soon it was rumored that no potash could be obtained from Germany, and that all fertilizer ingredients would, in all probability, take a sympathetic rise and remain high until the war was over. This rumor was soon known to be based on fact, and the farmer found himself, without money, trying to buy fertilizer on a rising market. This condition brought a crisis in the farm finances of the State, and the farmer was compelled to cry out for help.

All the agricultural institutions of the State responded liberally with "good advice," but the record shows that the *State Legislature and the State Department of Agriculture were the only institutions that were*

able to supplement their good advice with material aid. The Legislature of 1915 passed the lime law and the Commissioner of Agriculture put it into effect in a way that brought the price of mixed fertilizer down to from one-half to one-third of the price asked by the fertilizer manufacturers. The farmer was thus enabled to cope with the situation, and the years 1915-16 brought unusually good crops to North Carolina. The record also shows that the farmers purchased less fertilizer for these crops than they ever purchased before, for similar crops, in years past. Thousands of tons of ground limestone and marl were used, and the demand for these materials has increased by leaps and bounds; and the indications are that the farmer is going to find himself able to get even better crop results from the use of *liberal amounts* of limestone mixed with *limited amounts* of his other fertilizer ingredients than he has ever been able to get from these fertilizer ingredients used alone. In the spring of 1916 the fertilizer market made a sharp advance, but got such a set-back by the farmers that today the prices of acid phosphate and other fertilizer ingredients, except potash, are not thought to be very greatly in excess of what they were before the European war broke out.

In his efforts to carry out the lime law in a practical and efficient manner, the Commissioner of Agriculture in 1915 issued a circular entitled "*Lime Facts for Landowners*," in which he discouraged the use of "burned lime" for agricultural purposes and encouraged the use of lime carbonate or ground limestone instead. In May, 1916, he issued another bulletin entitled "*The Relation of Calcium Carbonate (Ground Limestone and Marl) in the Soil to Acid Phosphate and the Soil Phosphates*."

In September, 1916, the United States Agricultural Experiment Station at West Raleigh, N. C., issued Extension Circular, No. 24, entitled "*How to Use Lime on the Farm*," and sent it to the farm demonstration agents and other agricultural extension workers throughout the State, thus giving it the greatest possible publicity.

In this circular public contradiction was made of many of the leading statements contained in both of the above named publications issued by the Commissioner of Agriculture. This, of course, brought about a very unfortunate situation between the North Carolina Department of Agriculture and the United States Agricultural Experiment Station, *as both of these institutions could not be right in this matter; one of them must of necessity be in error, and the public must suffer in consequence of the publication of this erroneous information.*

We regret that the arrangement of the following discussion cannot be considered entirely logical; but an effort has been made to follow the circular, which has not been prepared with much care in this respect.

**DISCUSSION OF STATEMENTS CONTAINED IN EXTENSION CIRCULAR,
No. 24**

The following discussion is offered the people of North Carolina in order to show them the reliability and trustworthiness of the statements made in "*Lime Facts for Landowners*" and Bulletin No. 220, put out by the Commissioner of Agriculture, and the danger to the economic agricultural development of the State that would inevitably follow the adoption of the teachings of Extension Circular, No. 24, put out by the Director of the United States Experiment Station at West Raleigh.

CAUSTIC LIME.

First, attention will be called to the advice given in Extension Circular, No. 24, concerning the use of caustic lime for agricultural purposes. But before proceeding with this particular phase of this publication, it will be well to say that every informed agriculturist admits that all normal plant growth requires certain amounts of phosphate, potash, lime, and nitrogen in the soil. All of these plant-food constituents must be present in the soil, having been placed there by nature, or must be supplied from outside sources. Phosphate, potash, nitrogen, and lime are the ones most often purchased, the other necessary elements being generally abundantly present in normal soils. As a rule, that constituent, or those constituents, in which the soil is most deficient are the ones that are most often subjects of purchase.

It will also be well to say, at the outset, that burned or caustic lime was almost the only form of lime the people of America could get till limestone grinding machinery came into use, and that the custom of using burned lime became general from necessity. Nevertheless, burned lime has always been recognized as too concentrated a form of lime for agricultural purposes, and objectionable not only on account of the difficulty of handling, and the high original cost, but also on account of its detrimental effect on the potential fertility of the land. While farmers may, and some do, use caustic lime with good results, they all say large amounts of organic matter must be added to the soil in connection with it; otherwise, their lands will soon deteriorate in potential fertility. The wisdom gathered from the experience of the ages, in the use of caustic lime the world over, is crystallized in the well known proverb, "Lime and lime without manure makes both farm and farmer poor."

Now to Extension Circular, No. 24. In paragraph 1 of this circular the idea is conveyed that few farmers know how to use lime, and that unless great care is taken disastrous results are sure to follow its use. If burned lime alone is meant, the cry of warning is quite timely; but if unburned lime is to be included in the remarks, the advice is essentially wrong and misleading, as this form of lime tends only to build up and not to tear down the soil. There is, perhaps, no element of plant

food that can be used alone for as long a time with as good results on the average North Carolina soil as ground limestone.

In the same paragraph the useless warning is sounded against depending on lime alone, as no one is ever likely to advocate such a general practice in our present state of knowledge. It is true, however, as the circular admits, that there are many soils in the State that need only lime to enable them to produce large yields for many years. In such cases the limestone corrects any soil acid and reacts with the abundant mineral and nitrogenous constituents of the soil and renders them available for plant growth. In such soils as these *unburned lime alone can be depended upon to give large yields of our general crops for years in succession*. Indeed, *one of the leading functions of unburned lime in agriculture is to enable the farmer to utilize his otherwise unavailable stores of native plant foods*.

The whole of paragraph 1, page 3, of the circular seems to be intended as a warning to the farmer against the use of lime; and, as the circular does not say what form of lime is being discussed, the farmer is left free to apply the spirit of the paragraph to unburned as well as burned lime. He may thus fear to use either form, and lose heavily by the advice given.

In the first part of paragraph 2, page 3, the circular states that lime is good for legumes, but seldom needed for such crops as cotton, corn, etc. In the same paragraph, however, it says: "**The writer has seen applications of lime made to soils in a sour condition change the yield of corn from what was a complete failure the year previous to splendid yields the year following the application. In cases like this the chemical and physical conditions of the soil were such that, although the soil had abundant plant food for large yields for many years, yet ordinary crops like corn would not grow to any extent until these conditions were made suitable for their growth. When lime was added it neutralized or destroyed the acidity of the soil and at the same time improved its physical and chemical condition and its biological character to such an extent that afterwards, for years, the yields were good.**" And, in spite of all this, lime is not classed as a plant food, but as a plant medicine, forsooth, notwithstanding it is absolutely essential to the development of the plant tissues, and is found as a necessary constituent of these tissues. The fact of the matter is that ground limestone and marl are both direct and indirect plant foods of inestimable value, if properly applied, to all North Carolina soils.

In the last part of paragraph 2, page 4, the circular lays great stress on soil exhaustion from the use of lime. It says lime liberates inert potash, phosphoric acid, and nitrogen more rapidly than they would be liberated by natural causes in the absence of lime. "**Hence,**" it says, "**lime tends to hasten the exhaustion of these constituents of the**

soil rather than build the soil up, especially when lime is used alone and continuously without fertilizer on poor soil." If reference is made here to *caustic lime only*, we agree entirely with the conclusion; but if the intention is to include unburned lime, the conclusion is erroneous and misleading, because we have ample experimental evidence to show that carbonate of lime has a direct tendency to build up and not to exhaust the fertility of the soil. But the circular fails to define the term "lime," which to the popular mind always means burned lime, and thus the publication becomes doubly harmful—the reader does not dare move either one way or the other for fear he will make a disastrous mistake.

In section 1, chapter 265, Public Laws of North Carolina, 1915, we find "that only unburned lime shall be deemed lime for agricultural purposes," thus defining by legislative enactment the form of lime best suited for agricultural purposes.

It seems that there has been an especial effort made to confuse the farmer in the matter of purchasing lime for crop purposes by multiplying the number of terms or names under which it is sold. While there is no fertilizing ingredient of easier application or of simpler composition than agricultural lime, still, when the farmer attempts to make a purchase, he may be confronted by any one of the following twenty-six different names and be hard put to it to know just which kind to choose. The different names under which the farmer is likely to find agricultural lime offered on the market are as follows:

Air-slaked lime	Quicklime
Hydrated lime	Builder's lime
Rock lime	Stone lime
Prepared lime	Sulphate of lime
Caustic lime	Land plaster
Burned lime	Water-slaked lime
Barreled lime	Unslaked lime
CaCo ₃ lime	Agricultural lime
Unburned lime	Marble
Precipitated lime	Calcium oxide
Carbonate of lime	Shell lime
Marl-lime	Gypsum

But since there is but one form of lime suitable for general agricultural purposes, namely, the carbonate form, the Legislature deemed it best to suppress the above mischief-making list of terms and confine the terms used to designate the carbonate form of lime to "limestone" and "marl." On page 7 of Extension Circular, No. 24, however, we find fifteen of these different names for lime, all of which, the circular says,

are suited for agricultural purposes. The circular thus aids in mystifying the farmer on the subject of agricultural lime.

At the bottom of page 4 we find this statement: "If a heavy growth of some green manure crop is turned under, especially in the spring, an application of lime or marl should first be made in order to prevent the formation and accumulation of a large amount of organic acids in the soil by the rotting of the crop turned under." From the best evidence at hand, the only man who can wisely follow this advice, for the reasons offered, is the man who has wet lands (and here an application of drainage is likely to give better results than an application of marl), or lands that are already heavily charged with organic matter and are, in addition to this, water-logged throughout most of the year; and even here the use of lime is largely unnecessary for the purpose named, as it is the *old*, not the *new*, organic matter that produces the acids. On well drained, thoroughly aerated, upland soils the decaying organic matter does not produce acids, but alkalis, in the form of ammonia, in the early stages of decay; and this ammonia counteracts any organic acid produced simultaneously with its evolution. Well drained upland soils that are well supplied with organic matter are rarely excessively acid, as every farmer knows; and lime used on these soils should be used for an entirely different purpose from that of correcting acidity.

On page 5 we find: "If carbonate of lime (ground limestone or ground oyster shells) be used, it may go on in the spring with less danger of injury to the seed of the crop than when either of the two forms mentioned above is used." Here the idea is clearly given that *there is danger of injuring the seed of certain crops by their coming in contact with ground limestone or marl*. It is hardly probable that any intelligent agriculturalist in the world would corroborate this idea. The idea is entirely erroneous and gravely misleading, as *ground limestone and marl have no injurious effect whatever on any seed of any crop known*. On the other hand, burned lime is injurious to seeds or any other organic matter with which it comes in contact.

On the same page we find this expression: "The carbonate or air-slaked form of lime does not act as energetically as do the quick and water-slaked forms." Here the idea is clearly given that carbonate of lime and air-slaked lime are one and the same thing, which is not correct. Air-slaked lime, according to Van Slyke, is highly caustic, whereas carbonate of lime will not corrode or burn any organic matter whatever.

On page 6 is found this statement: "Never mix lime, especially in the caustic or water-slaked forms, with any material containing ammonia before applying it to the soil, because the lime would tend to set free and thus lose some of the ammonia in the atmosphere."

For this reason it is exceedingly unwise to mix lime directly with stable manure." Of course, the reference here is to burned lime only, as this is the only form of lime which does attack and injuriously affect any form of organic matter. We agree entirely with the spirit of this statement, but do not understand why caustic lime will attack and injuriously affect organic material containing ammonia *before* applying it to the soil, and will not attack this material *after* it has been applied to the soil. It would seem that caustic lime that would liberate ammonia from organic matter *out of the soil* would also liberate it from this organic matter *in the soil*; but, in spite of the advice given above, the circular advocates the use of burned lime spread directly on the land and worked into the soil with agricultural implements, thus forcing this caustic substance into direct contact with the soil humus where the liberation of ammonia can go on without hindrance.

On the same page, after naming the various forms of lime, as caustic, carbonate, and hydrated, the circular states: **"As all three of these forms of lime are suited for agricultural purposes, it becomes important in purchasing to know the relative equivalents in actual lime (calcium oxide)."** Here we have the plain statement that burned lime is suitable for agricultural purposes, and a little further on, on page 8, we find the circular advocating the use of burned lime or carbonate of lime, depending solely on the delivered cost of equivalent amounts of calcium oxide. Here we find it also emphasizing the idea that, freight rates and other items of cost considered, it will be found *cheaper* to buy lime in the caustic form than in the carbonate form. But let us see how this proposition works out:

From our general correspondence we selected letters containing quotations on burned "agricultural lime" from Tyrrell, Wilson, Lenoir, Pender, and Craven counties, as representing the great bulk of the territory over which burned lime has been and is most generally used.

Assuming that the limestone from which the "agricultural lime" was burned to be pure calcium carbonate (which is almost never the case), and to burn into 1,120 pounds of calcium oxide for every ton of calcium carbonate used, we find that it will take about 4,500 pounds of our high-grade marl to equal, in calcium oxide content, one ton of this pure burned "agricultural lime."

Now one ton of this pure "agricultural lime" will cost, as an average of the five counties named, \$8.27 a ton, laid down at the station; while enough high-grade marl to make one ton of this burned "agricultural lime" will cost, as an average of the five counties named, \$5.08 laid down at the station, thus making a difference of \$3.19 a ton in favor of buying lime in the *carbonate form* rather than in the caustic form as advocated in the circular. Or, to put the same facts differently:

On an average, one ton burned lime laid down in North Carolina costs about.....	\$8.27
Enough unburned lime to make a ton burned lime costs	5.08
	<hr/>
Difference in favor of unburned lime.....	\$3.19

It is plain, therefore, that the advice of Extension Circular, No. 24, in this case, is wholly wrong, and if followed by the farmers would cost them untold thousands of dollars.

To show what this advice would have cost the farmers during the past fifteen months, had they made their purchases of lime in accordance with these views, we have only to multiply the 18,000 tons of lime carbonate by 56 per cent to get the number of tons of burned lime contained in it, and this result by \$3.19. This gives us \$32,155.20 as the actual cash loss that would have been unavoidably sustained in the original outlay. Now, the most reliable experiments with the use of burned lime as compared with unburned lime show conclusively that, on the average, about \$7 worth of soil nitrogen is destroyed for every ton of burned lime used. Multiplying the 10,080 tons of burned lime by \$7 gives us the additional loss of \$70,560 to be added to the original loss of \$37,296, making a grand total loss of \$102,715.20 the farmers would have sustained had they taken the advice given in Extension Circular, No. 24, rather than that contained in the circular entitled "*Lime Facts for Landowners.*"

At the bottom of page 8 reference is made to the results of some experiments conducted with caustic lime on the Iredell Test Farm, stating that **"In securing these results lime has been applied at the rate of 500 pounds of burned lime or 1,000 pounds of slaked lime per acre."** It is well known that the soils of the Iredell Test Farm are very low in organic matter content. The use of caustic lime, therefore, would hardly be expected to be attended with favorable results on crops that were not members of the legume family, as the first effect of the lime would be to sterilize the soil, deplete it of a part of its organic matter, and thus reduce bacterial action and prevent the maximum evolution of nitrates. The results here, therefore, showed no gain in the cotton crop from the use of burned lime; neither were there any favorable results with lime on cotton at the Raleigh Station, the soils of which are very similar to those of the Iredell Farm in organic matter content. When, however, caustic lime was used on cotton at the Edgecombe Farm good results were secured, because, as the saying goes, "There is organic matter to burn" in the soils of this farm. The good results here were secured, doubtless, not only from the incidental sweetening of the sour soils, but also from the liberation of an excess of nitrogen from the large supply of humus in these sandy loams. The results with corn here were similar to those with cotton.

On page 11 we find this statement: "At the Iredell Farm the average results show that lime, whether used alone or in combination with fertilizing materials carrying nitrogen, phosphoric acid, and potash, was used at a loss. On a whole, indications were that for the growing of corn the soil on this farm does not especially need lime when corn, cotton, small grains, and similar crops have been grown continuously on the land, but that they are benefited by lime when peas, clover, and similar crops have been grown and turned back into the soil, thereby adding a large amount of vegetable matter to it." In other words, caustic lime did no good where there was no organic matter to burn, but when large amounts of organic matter were added this caustic lime proceeded to burn this organic matter and liberate enough nitrogen and ammonia to make a showing in the succeeding crop. The experiments on the Buncombe Farm show, also, that the caustic lime was profitable in growing the corn crop, especially where *large amounts of organic matter were transmitted or added to the soil*. This, it will be seen, is a strong argument against the use of burned lime for agricultural purposes, as no results of importance were secured anywhere unless large amounts of humus were supplied on which this caustic material could wreak its vengeance.

On page 9 are two soil analyses that show a calcium oxide content of 5,000 to 8,000 pounds to the acre. These analyses are misleading, as there can be no caustic lime in any soil unless placed there by man. The lime is in a silicate and, therefore, unavailable form in these North Carolina soils.

ACTION OF BURNED AND UNBURNED LIME ON SOIL HUMUS.

Let us now turn to the literature on the relative efficiency of carbonate lime and burned lime for maintaining soil fertility, and for other agricultural purposes as discovered by the leading agricultural thinkers and experimenters of the present generation, and we will find that ground limestone and burned lime are about as much alike in their action as water and fire. Both cause a necessary liberation of the nitrogen from the organic matter of the soil for use in the production of the crop. But the two forms of lime liberate the nitrogen in two very different chemical bodies that act very differently toward the potential fertility of the land.

Ground limestone neutralizes any excessive acidity and otherwise creates a favorable condition for the growth and multiplication of nitrate-forming organisms in the soil. These organisms attack the soil humus and liberate its contained nitrogen and combine this nitrogen with calcium or lime to make calcium nitrate; or with soda to form sodium nitrate; or with potash to build up saltpetre or potassium nitrate. All of these nitrogenous compounds are nonvolatile, solid bodies, that are readily dissolved in the soil water and taken up by the crop. Little or none is lost by leaching under normal conditions, as the crop takes it

up as fast as formed. All of the soil nitrogen thus developed from the soil humus is utilized to create more humus, and thus increase the supply in the soil. The action is comparatively slow, and the soil organisms, collecting nitrogen from the air at the same time they are extracting it from the organic matter of the soil, greatly increase the total supply of soil nitrogen over and above the amount originally contained in the soil humus. The growing crop, thus enabled to use both the free nitrogen of the air and the combined nitrogen of the soil, will, under favorable conditions of agricultural practice, not only maintain but even increase the organic matter content of the soil while producing satisfactory yields for the farmer. But not so with burned lime.

Burned lime attacks the organic matter of the soil just as vigorously as it attacks one's flesh and destroys it by "eating away its substance through chemical action." During this process of chemical destruction of the organic matter, nitrogen is set free just as it is set free when one burns a pound of beefsteak on the stove or burns his corn stalks and cotton stalks in the field. But when caustic lime acts on soil humus it first kills the nitrate-forming organisms and liberates the nitrogen, not in the form of a nonvolatile nitrate, but in the form of ammonia—a gas that escapes from the soil into the air and is lost to the farmer and to his land. Caustic lime burns the organic matter of the soil just as fire burns wood; and as the smoke from the furnace contains nitrogenous gases, so the exhalations from soils treated with caustic lime contain, in a gaseous form, the nitrogen of the rapidly oxidizing humus.

As this ammonia is escaping upward through a moist soil some of it is held in solution by the soil water and is finally oxidized to a nitrate and used by the plant; but all that fails to be caught in the meshes of the moist soil is, of course, lost, and the land relatively reduced in fertility. It is a common experience that caustic lime gives as good and, in some cases, better immediate results than ground limestone; but the experience is equally common that a large crop by the use of caustic lime this year means a reduced potential fertility and a decreased crop yield the years following. Ground limestone does all the good things burned lime will do, and none of the bad things.

CITATION OF AUTHORITIES.

There is an overwhelming amount of experimental evidence to show that unburned lime is at all times and from every point of view to be preferred to caustic or burned lime for agricultural purposes. Such men as Dr. L. L. Van Slyke of New York, Wheeler of Rhode Island, Hopkins of Illinois, A. D. Hall of England, and a host of other experimenters and leading thinkers the world over all agree that from a general soil improvement standpoint ground limestone is in every way superior to burned lime.

Experiment Station Record, vol. 28, page 624, Moores, Hampton, and Hunter of the Tennessee Station, in their investigations of the effect of caustic lime and green manure on the content of nitrogen and humus in the soil, state: "Where the cowpea crop was turned under each year for five years there was found, at the end of that time, on the unlimed sections, an increase of 3.79 per cent of humus, as an average of the 12 plats, but *neither gain nor loss on the corresponding limed sections*. Where the cowpea crop was removed for five years there was an apparent gain of 2.38 per cent on the unlimed section as an average of the four plats, but an apparent loss of 3.17 per cent in the corresponding limed sections." Where caustic lime was used and the cowpea crop turned under and neither gain nor loss of humus was shown, we have a concrete illustration that the caustic lime burned up the organic matter as fast as it was supplied by the turning in of the crop. Where the cowpea crop was removed for five years, there was a difference in the humus content of the soil of over 5 per cent in favor of the sections which had not been treated with caustic lime.

In a letter received from the West Virginia Experiment Station we find a discussion of the results of an experiment in the use of caustic lime on soils of that station low in organic matter content. These results show that when these relatively poor soils were treated with complete fertilizer the nitrogen content was increased 728 pounds to the acre during a fifteen-year period, and that the humus content, during the same time, was increased 14,856 pounds. But when caustic lime was added to the complete fertilizer the nitrogen content was reduced from 728 to 213 pounds to the acre, and the humus content from 14,856 to 2,586 pounds. When manure alone was used on this land the nitrogen content was increased 1,323 pounds, and the humus content 26,098 to the acre during the fifteen-year period. But when caustic lime was used on the land with the manure the nitrogen content was lowered from 1,323 to 870 pounds, and the organic matter content from 26,089 to 19,481 pounds. When caustic lime was used alone it lowered the nitrogen content 92 pounds from what it was before the lime was used, and the organic matter content was reduced 3,235 pounds below the normal amount in the soil at the beginning of the experiment.

In an address before the Legislature of Virginia in January, 1912, Dr. Cyril G. Hopkins stated: "For many years I have searched the records of agricultural history and investigation, and I have not found evidence in favor of using caustic lime in preference to lime carbonate."

In "Ground Limestone for Southern Soils" Dr. Hopkins says: "The most extended investigations on record relating to the use of ground limestone and caustic lime in comparative tests have been conducted by the Pennsylvania Experiment Station. After twenty years results had been secured the Pennsylvania Station reports data showing that the land treated with ground limestone had produced, per acre, during the twenty

years, 99 bushels more corn, 116 bushels more oats, 13 bushels more wheat, and 5½ tons more hay than the land treated with caustic lime.

"Moreover, after these investigations had been in progress for sixteen years soil analysis showed that the caustic lime had destroyed 4½ tons of humus and dissipated 375 pounds of nitrogen per acre as compared with the ground limestone. *This means that every ton of caustic lime used had destroyed the equivalent of 4½ tons of farm manure, and had dissipated soil nitrogen that would cost about \$7 to replace in commercial form.*"

Dr. Frear of the Pennsylvania Station says, in discussing these investigations: "In each case the yields with the carbonate of lime (ground limestone) showed superiority under conditions of this experiment over those following an equivalent application of caustic lime."

In the same publication, page 8, Dr. Hopkins says: "*Half-informed people often advise farmers to use ground limestone or burned lime, depending only upon the relative cost for equivalent quantities; but,*" says he, "dare we ignore the enormous destruction of humus or organic matter and the dissipation of soil nitrogen as shown by the long continued Pennsylvania experiments, and fully confirmed by the more recent Tennessee experiments? On the contrary, these modern carefully conducted chemical investigations as to the effect of caustic lime upon the soil itself forcibly remind us of the long established opinion of European farmers concerning caustic lime, that lime makes the fathers rich, but the sons poor." In other words, *caustic lime burns out the organic matter; gives excessive stimulation to the present crop; liberates and destroys the soil nitrogen; and greatly reduces the potential fertility of the land.*

On October 23 we addressed a letter to the experiment stations throughout the United States and its island possessions, asking them which, in their opinion, is better to use, caustic lime or carbonate of lime, in cropping systems where the development and maintenance of a good supply of humus or organic matter is necessary to the production of economic yields. Up to this time 45 stations have replied. Out of the 45 that have replied, 32 prefer the ground limestone to caustic lime, 6 have no opinion in the matter, and 7 make no choice between the two forms of lime for agricultural purposes. Four of the stations, Pennsylvania, Tennessee, and West Virginia, and Maryland have actually tested the relative value of the two forms of lime for agricultural purposes, and these stations are loud in their condemnation of the caustic or burned form.

The net result, then, of the advice given in extension circular, No. 24, to the farmers of North Carolina concerning the use of Caustic Lime on their poor, run-down soils is the constant and systematic reduction of the humus supply of their lands and the consequent cutting off of the natural supply of cheap soil nitrates, and the forcing of these farmers into the fertilizer market to buy high-priced ammoniated goods with

which to supply the necessary nitrogen for normal crop production. Look at the facts from whatever angle one may, the logic of the situation drives one to this inevitable conclusion.

RELATION OF LIME CARBONATE TO ACID PHOSPHATE.

We will now turn to another and more important phase of this matter, namely, that in which the circular contradicts the advice given in Bulletin No. 220, concerning the mixing of ground limestone with acid phosphate and ammoniated fertilizers and as a substitute for potash in the fertilizer formula, and for prolonging the availability and increasing the efficiency of the acid phosphate in the soil.

On page 6 we find this statement: "**Generally, it will be unwise to mix finely ground limestone with acid phosphate, as it is illogical and unwise, for the reason that the lime is likely to have an injurious effect upon the available phosphoric acid content in the acid phosphate.**" While the Pennsylvania Station mixed caustic lime with soluble phosphate with excellent results, Bulletin No. 220 of the North Carolina Department of Agriculture does not advise such practice. It does advise, however, the mixing of ground limestone and marl with acid phosphate *for the double purpose of substituting lime carbonate for potash in the fertilizer formula and for preventing the immediate formation of the insoluble phosphates of iron and aluminum in the soil*; and this advice has been taken with gratifying results by dozens of farmers the past season. In support of its proposition the Extension Circular, No. 24, cites some work by Brackett & Freeman of the South Carolina Experiment Station in which they found that acid phosphate mixed with ground limestone tended to revert from the monocalcium to the tricalcium form. No other experiment in support of this proposition is cited. But the following quotation from a letter from the J. L. Vance Fertilizer Company of Chilhowie, Va., 1914, will show the seriousness of the above objection:

"We have also made tests as to the effect of ground limestone causing reversion of available phosphoric acid, and while we have found that there is a slight reversion *after the limestone has been allowed to set in the mixture for two or three months, there is no appreciable reversion where it is used within a reasonable time. Even where it is allowed to set as much as three or four months, the reversion is not sufficient to be an objection.*

"Our experience with ground limestone is that it puts our goods into the finest possible mechanical condition, and we prefer it to anything we have tried in the way of a filler."

On the same page of the circular we find a plea for the manufacturers of acid phosphate, as follows: "**The manufacturer of acid phosphate has gone to considerable expense and trouble to put upon the market a material which will contain a higher per cent of available**

phosphoric acid. If the farmer, after buying acid, mixes with it lime and lets the mixture stand for some length of time, it is probable, under ordinary conditions, a material quantity of the available phosphoric acid may be changed to the insoluble form." Now, if the mixing of acid phosphate with ground limestone is going to cause the acid phosphate to be less available to the crop, we can see no reason why the fertilizer manufacturer should, on financial grounds, have any objection to raise, as such action on the part of the farmer would cause him to buy more acid phosphate in order to produce normal crop yields. The fertilizer manufacturer, therefore, might welcome rather than oppose the mixing of ground limestone with acid phosphate. On the other hand, if the mixing of ground limestone with acid phosphate is going to prevent the formation of the insoluble phosphates of iron and aluminum, and promote the formation of di-calcium phosphate, and thus prolong the availability of the phosphate in the soil, and enable the farmer to utilize, not a small part, but the whole of his application, and, in this way increase crop production, and at the same time lower the cost, the fertilizer manufacturer might, pursuing a narrow and shortsighted business policy, object to the farmer making any such mixture of his acid and limestone.

On the same page we find the broadcasting of lime advocated to the exclusion of mixing it with the fertilizer ingredients, as follows: **"In using lime on a soil that is to receive an application of acid phosphate alone, or mixed with other materials, the best plan to follow will be to add the lime broadcast, work it into the soil with a harrow, and then apply the acid phosphate, or acid phosphate mixture in the drill just before the crop is planted."** This method of applying lime or limestone insures the least possible contact with the acid phosphate in the fertilizer mixture, and insures the greatest amount of reversion possible with the iron and aluminum oxides of the soil. The locking up of the soluble phosphates into iron and aluminum compounds seems to occur very quickly after the material is applied to the soil, and it can be easily seen that this method of application will allow the greatest possible mischief to be done before sufficient limestone can come in contact with the soluble acid to arrest the process. To illustrate: An acre of soil 6 inches deep weighs about two million pounds. On the average North Carolina soil 1 per cent of limestone, broadcast and worked into the soil, will be necessary to do any appreciable amount of good in preventing the formation of iron and aluminum phosphates. Now, it would take 10 tons of limestone to the acre to add 1 per cent of lime carbonate to the soil to a depth of six inches, and no farmer is likely to add this amount of limestone to his land at one time. Moreover, if 1 per cent of these red clayey soils were limestone added broadcast and worked in to a depth of 6 inches and the acid phosphate put in the drill, a simple mathematical calculation will show that the acid phosphate

would come in contact with about a *hundred times as much iron and aluminum oxide* as limestone in the same length of time, and, of course, there would be nearly a *hundred times as much acid* revert with these bases as with the calcium base. On the other hand, the mixing of the limestone with the acid before applying it to the soil assures the least possible amount of reversion to these insoluble compounds.

In Bulletin 140 of the North Carolina Experiment Station, published in 1910, entitled "*Fertilizer Experiments with Corn on the Piedmont Red Clay Loam Soil*," it is shown that 450 pounds of 14 per cent acid phosphate to the acre was used for an increase, as an average of seven years tests, of 10.9 bushels of corn and 814 pounds of stover to the acre. This 450 pounds yearly acre application of acid phosphate contained 17 pounds of the element phosphorus, while the increase in the crop directly attributable to the use of the acid phosphate contained only about 3 pounds of the element phosphorus, thus leaving 14 pounds of phosphorus unaccounted for in the crop and locked up in available forms in the soil. *By this method of application there had been destroyed over 2,720 pounds of acid phosphate during the seven years, and only about 430 pounds utilized.* This fact is not brought out in the discussion of the experiment, however.

In the April Bulletin, No. 195, published in 1914, the experiments with the fertilization of cotton on the Edgecombe Test Farm show that 600 pounds of 14 per cent acid phosphate was used for an increase in the crop, directly attributable to the use of the acid, of 356 pounds of seed cotton as an average of seven years tests. The annual application of 600 pounds of acid phosphate carried 22 pounds of the element phosphorus, while the increase in the crop of 356 pounds of seed cotton carried about 2 pounds of phosphorus, leaving 20 pounds unaccounted for in the crop and locked up in unavailable forms in the soil, except what was turned back into the land with the stalks and leaves. *By this method of application, therefore, there had been put into the soil 4,200 pounds of acid phosphate, and a little over 250 pounds taken out in the crop. About 3,950 pounds had been locked up in unavailable forms and lost.*

CITATION OF AUTHORITIES.

Prof. George Roberts of the Kentucky Experiment Station, in his bulletin on "*Use of Ground Limestone in Kentucky*," says: "If acid phosphate is being used on soil deficient in limestone, the addition of limestone will increase the efficiency of the acid phosphate." The following results obtained on the London Experiment Field, Kentucky Agricultural Station, will illustrate this point: "In 1911 soil with no treatment produced 13.7 bushels of corn; with acid phosphate 25.1 bushels; with acid phosphate and lime 38.0 bushels." In 1912 soil with no treatment produced 20.7 bushels of corn; with acid phosphate 22.2 bushels of corn; with acid phosphate and lime 51.9 bushels of corn.

On pages 259-60 of "*Fertilizers and Manures*" Dr. A. D. Hall of the Rothamsted Experiment Station, England, says: "But nitrogenous compounds in the soil are not the only ones rendered more available by the presence of carbonate of lime; both phosphoric acid and potash are thereby kept or brought into a more soluble form. When soluble phosphates are applied to the land they are precipitated either as dicalcium phosphate, ferric phosphate, or aluminum phosphate; and on soils containing any reasonable amount of calcium carbonate the dicalcium phosphate will predominate, while iron and aluminum phosphate will predominate on the sands and clays where calcium carbonate is lacking. Now, the effective solubility of iron and aluminum phosphates in soil water is very much below that of the precipitated calcium phosphate; consequently, their phosphoric acid is much slower in reaching the plant, *which may remain short of this necessary constituent even though large amounts of phosphates have been applied to the soil.* Similarly, a soil may contain considerable amounts of phosphoric acids which, in the absence of lime, is combined with ferric oxide or alumina so as to be in a highly insoluble condition. For example, a soil derived from the marlstone (a geological formation in England) has been found to contain 84 hundredths of 1 per cent of phosphoric acid, but yet show great response to phosphatic manures, because, at the same time, it contained over 28 per cent ferric oxide and no calcium carbonate. Applications of calcium carbonate are of great value on these soils because they form a certain amount of calcium phosphate by interaction with the iron or aluminum phosphates, and so increase the proportion of phosphoric acid in the soil water."

In the annual report of the Virginia Agricultural Experiment Station for 1909-1910 Drs. Ellett and Hill make the following significant observations: "Agricultural chemistry teaches us that the soluble phosphates are reverted or fixed, and when the combination takes place with the iron and the aluminum compounds the probabilities are that the reversion or fixation which occurs are in forms which remain forever unavailable to plants. *If this reversion takes place, it is folly to apply large quantities of soluble phosphates to the soil in which iron and aluminum predominate over the other bases, as four-fifths of it would be forever lost, and would be dead capital on the farmer's hands.*"

After conducting some very carefully planned and ingeniously devised experiments to test the matter, these gentlemen had the warning sounded in the above quotation amply confirmed. In discussing the results of their experiments, Drs. Ellett and Hill state, on pages 54-55 of the above named publication, that "A review of these experiments conducted with the solvents used to determine the availability of phosphoric acid in soils and fertilizers show that the substances found in the different soil types fix phosphoric acid from water solutions into compounds of different solubility. The hydroxides of iron and aluminum lock up or

fix 60 to 70 per cent of the water-soluble phosphates into insoluble, or, as measured by these solvents, into unavailable form. Where lime was mixed with equal quantities of iron and aluminum hydroxides the fixation of phosphoric acid was not so great, as 57 per cent *was available*, showing that a part combined with the lime. *Where calcium and magnesium carbonates were used as a fixing agent the resulting compounds were completely dissolved and would have to be classed as available.*" The entire contents of the May Bulletin, No. 220, of the North Carolina Department of Agriculture should now be read carefully for further information on this subject. This bulletin contains fertilizer formulas in which limestone is substituted for potash and mixed with acid phosphate and cotton-seed meal.

The farmers were urged to use these formulas the past season in which lime carbonate is substituted for potash and mixed with acid phosphate and cotton-seed meal to make a complete mixture for our general farm crops, including tobacco. Some forty or more took the advice of Bulletin No. 220 and used the formulas.

Thirty-one of these farmers have reported results by letter which we have on file for public inspection, while ten or twelve reported verbally. Out of the forty or more who actually tested the advice given in Bulletin No. 220, thirty-nine were highly pleased with the results, while the other three could not make a definite statement on account of the wet weather. A number of them said they got as good results by using these formulas, that cost them, perhaps, not over \$15 a ton, as from the regular 8-2-2 that cost, last season, over \$30 a ton. It will be seen, therefore, that in addition to the unimpeachable evidence already given, we have here thirty-nine witnesses for Bulletin No. 220, and against Extension Circular, No. 24, which opposes such action on the part of the farmers.

The following letter from the N. P. Pratt Commercial Fertilizer Laboratories in Atlanta, Ga., will show what the leading commercial fertilizer experts of the South think of the contents of Bulletin No. 220, concerning the mixing of ground limestone with acid phosphate. The letter follows; copy of the analysis referred to follows this letter:

ATLANTA, GA., July 21, 1916.

HON. W. A. GRAHAM,
Commissioner of Agriculture,
Raleigh, N. C.

DEAR SIR:—My attention has just been called to the Bulletin of the North Carolina Department of Agriculture, Whole No. 220, which has been issued to the people of the State by your direction. Please permit me to congratulate you on the publication of this bulletin in the interest of agriculture in North Carolina. Your recommendations constitute a forward movement in the interest both of the farmers and of the manufacturers and mixers of commercial fertilizers, and its good effects are going to be heard from.

There is one point in connection with the use of natural lime carbonate as a part of the commercial fertilizer mixtures which appears not to have

been particularly noted, and this point is, to my mind, a vital one. I should add that it fully explains the beneficial facts your bulletin calls attention to.

Illustrating what I mean, I am handing you a copy of an analysis of the N. P. Pratt Laboratory, in which I have taken pains to have determined the actual amount of *free* phosphoric acid in a representative sample of acid phosphate thirty days old. Of course, you will recognize that this *free* phosphoric acid, which is always present, shows in all official analyses as "water-soluble" phosphoric acid, and no distinction is drawn between the free phosphoric acid and the monocalcium phosphate, both of which are soluble in water. Whenever free phosphoric acid is applied to the soil, it will immediately combine with the iron and aluminum in that soil, and lose its solubility in water; but if it is brought into combination, in process of manufacture, with ground limestone, it will combine to form dicalcium phosphate, which is not only soluble in the ammonium citrate solutions of the analytical methods, but it is most readily soluble in the soil solution and much more available to the plant than the phosphates of iron and alumina which would otherwise be presented in the soil to the plant.

From the manufacturer's side of the case free phosphoric acid, which absolutely and undoubtedly exists to a large extent in all acid phosphates, is a nuisance from every point of view. It gums up his fertilizer machinery; it destroys his bags, and it absolutely prevents him from safely mixing, in his fertilizer formulas, the useful nitrate of soda without danger of its decomposition and loss through its reaction with the free phosphoric acid in acid phosphate.

We are learning something in America, and our practical Commissioners of Agriculture can immensely aid to spread this information if they will go after it like you are doing. Our people, both the manufacturers and the farmers, have so long traveled in the beaten track of 10-2-2, or 9-2-3, or 8-2-2, etc., in their fertilizer formulas, that the fertilizer manufacturer and the farmer do not appear to understand the real composition and applicability of their goods. It is, therefore, certainly time that practical men like yourself in official position should begin to spread useful information for the benefit both of the manufacturer and the consumer.

We cannot suppose that any well posted agricultural chemist could maintain that the phosphates of iron and alumina are as desirable a plant food as dicalcium phosphate is, notwithstanding some of these forms of phosphoric acid are soluble in the ammonium citrate solution of the analytical methods; and as commercial acid phosphate through its free phosphoric acid (and, also, though more slowly, through its monocalcium phosphate) will readily form, with the soil, phosphates of iron and alumina, I have reached the conviction that the laws of the States ought, by preference, to require the manufacturer to convert the free phosphoric acid, which is now so rampant in his acid phosphates, into dicalcium phosphate by the use of lime carbonate, in order to forestall and prevent the quick formation in the soil of the phosphates of iron and alumina.

Some of these days these facts will become so well recognized by well informed agriculturists that we will wonder why we have so long shut our eyes to patent chemical and plant-food facts; and as your Department is the first, to my knowledge, in the Southern States to begin to see things in the way they ought to be presented, I trust you will pardon this long letter congratulating you upon the movement you inaugurated in North Carolina.

With assurances of my high esteem, I remain,

Yours very truly,

(Signed) N. P. PRATT.

N. P. PRATT LABORATORY.

CERTIFICATE OF ANALYSIS.

ATLANTA, GA., June 29, 1915.

Sample No. 45809.

Received June 7, 1915.

Marked: Acid Phosphate 30 days old, from Old Dominion Guano Company.

For N. P. Pratt, Atlanta, Ga.

Contains:

Moisture10.39 per cent.

Composition of the water-soluble filtrate expressed in per cents of original sample.

Total calcium oxide.....	8.35	
Total aluminum oxide.....	.38	
Total ferric oxide .....	.33	
Total sulphur trioxide.....	7.22	
Total phosphorus pentoxide.....	....
Equivalent to	18.28	
Sulphur trioxide combined in calcium sulphate.....	12.28	
P2O5 combined in monocalcium phosphate.....	9.60	
P2O5 combined in aluminum phosphate.....	.66	
P2O5 combined in ferric phosphate.....	.29	
P2O5 uncombined (free phosphoric acid).....	7.73	

Respectfully submitted,

(Signed) N. P. PRATT LABORATORY.

It has been shown that the net results of the teaching of Extension Circular No. 24 concerning the use of caustic lime rather than carbonate lime was to cut off the cheap, native supply of soil nitrogen and force the farmer into the fertilizer market to purchase high-priced ammoniated goods with which to furnish commercial nitrogen to grow his crops.

It will now be seen that the net results of its teaching, in opposition to the mixing of limestone with acid phosphate, is to force the farmer to purchase many times as much acid phosphate as his crop can get a chance to utilize, and thus increase his fertilizer cost without proportionately increasing the yield.

On the other hand, the net result of the teachings of Bulletin No. 220 is the building up of the soil humus and the consequent increasing of the native supply of soil nitrogen; the liberation and utilization of a part of the enormous supply of native potash, and the increasing of the efficiency of the applications of commercial forms of phosphate.

The advice in Bulletin No. 220 will decrease the cost and increase the efficiency of fertilizers; the advice in Extension Circular No. 24 will increase the cost and decrease the efficiency. Bulletin No. 220 will build up the agriculture of the State and render the farmers independent in their own homes; Extension Circular No. 24 will decrease the productive capacity of the soils and make the farmers slaves to commercial plant foods.

LEAF TOBACCO REPORT FOR NOVEMBER, 1916

Pounds sold for producers.....	32,473,036
Pounds sold for dealers.....	1,355,795
Pounds sold for warehouses.....	1,978,289
<hr/>	
Total.....	35,807,120

THE BULLETIN
OF THE
NORTH CAROLINA
DEPARTMENT OF AGRICULTURE
RALEIGH

Vol. 38, No. 2

FEBRUARY, 1917

Whole No. 229

VARIETY TESTS OF CORN

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

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LETTER OF TRANSMITTAL

MAJOR W. A. GRAHAM,

Commissioner of Agriculture.

DEAR SIR:—I am sending you herewith a manuscript by R. Y. Winters and J. H. Hall, Jr., of the Division of Agronomy, giving the results of variety tests of corn conducted on the Central Farm and at the branch stations during the year 1916.

I would recommend that this be published as the February BULLETIN, 1917, of the Department.

Respectfully submitted,

C. B. WILLIAMS,

Chief, Division of Agronomy.



FIG. 1. EACH VARIETY IS HARVESTED SEPARATELY.



FIG. 2. THE EARS FROM EACH VARIETY ARE HUSKED BY HAND AND WEIGHED.

VARIETY TESTS OF CORN

BY R. Y. WINTERS AND J. H. HALL, JR., DIVISION OF AGRONOMY.

The corn crop in North Carolina for 1916 is estimated to be 53,650,000 bushels. This is a decrease of 10,300,000 bushels as compared with the very large yield for 1915. This difference is no doubt due largely to three factors: the increased cost of commercial fertilizers and the consequent smaller amounts used; the unfavorable weather conditions, in the nature of a drouth, which existed over the State from April 9 to May 15; and the floods which occurred in the summer, completely destroying a large portion of the corn crop in the western section and materially affecting the yields in other localities.

Aside from the increased yields following improved cultural methods, systematic crop rotations, etc., the corn yield for the State could be largely increased by the intelligent practice of selecting the varieties which give the highest yield of good corn in the different sections of the State. The Experiment Station has been conducting variety tests with corn for the past several years, in order to furnish corn growers reliable information regarding the yields of corn varieties on the different types of soil and under different climatic conditions existing in the State. During the past two years a special effort has been made to locate other good varieties within the State. Some of the new varieties have yielded well on the test farm of their locality, while others have given very poor yields. As a result of these tests, a few growers have discarded their old varieties and have replaced them with varieties which have shown up best in the tests conducted nearest them.

Forty-two varieties, in all, were tested on six of the State Test Farms last year. There were also two coöperative tests made, one at Terra Ceia and one at Elizabeth City.

In all cases uniform plats were chosen, so that any differences in yields would be due entirely to differences in the varieties. The varieties were planted in duplicate series, which together made one-twentieth of an acre. (The series at the Iredell Test Farm was only one twenty-fifth of an acre, rather than one-twentieth.) The corn was planted in rows 4 feet apart, and was dropped, by hand, 2 feet in the drill. It was later thinned to one stalk to the hill.

THE VARIETIES

Among the forty-two varieties tested there were three varieties of yellow corn, the remainder being white. The varieties included large one-eared, intermediate, and the small many-eared corns.

TABLE I—VARIETY TESTS OF CORN AT THE BUNCOMBE BRANCH STATION, 1916.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Average Height in Inches at Maturity		Number of Ears	Number of Stalks Bearing—				Yield Per Plat and Related Data				Shelling Capacity				Yield Per Acre							
		Stalk	Ear		Per Plat	Average Per Stalk	No Ears			One Ear	Two Ears	Three or More Ears	Pounds of Stover	Pounds of Ears	Per Cent Stover	Per Cent Ears	Pounds of Ears to Shell One Bushel of Corn	Weight of Measured Bushel of Shelled Corn	Weight of Cobs from Bushel of Shelled Corn	Per Cent Grain	Per Cent Cob	Pounds Stover	Pounds Ears	Bushels of Shelled Corn
1	First Generation Cross, No. 182.....	279	100	40	267	.95	19	253	7	0	137	164.0	45.6	54.4	60.70	50.0	10.70	82.2	17.8	2740	3280	54.0		
2	Weekley's Improved.....	278	114	50	329	1.18	11	206	60	1	170	153.0	52.7	47.3	63.40	52.0	11.40	82.0	18.0	3400	3060	48.2		
3	Southern Beauty.....	272	107	47	282	1.03	21	220	31	0	147	137.5	51.7	48.3	57.40	49.0	8.40	85.3	14.7	2940	2750	48.0		
4	Latham's Double.....	270	117	56	273	1.01	25	217	28	0	103	141.5	57.7	42.3	59.25	48.0	11.25	81.0	19.0	3860	2830	48.0		
5	Parker's Prolific.....	273	104	45	303	1.11	10	223	40	0	156	154.0	50.4	49.6	65.20	51.5	13.70	79.0	21.0	3120	3080	47.2		
6	Jarvis' Golden Prolific.....	270	104	43	310	1.14	12	206	52	0	153	141.0	52.0	48.0	62.00	52.5	9.55	84.6	15.4	3060	2820	45.4		
7	Deaton's Two-Ear.....	271	110	52	230	.84	43	226	2	0	160	130.5	55.0	45.0	58.50	48.5	10.00	83.0	17.0	3200	2610	44.6		
8	Cooke's Prolific.....	275	107	48	334	1.21	13	190	72	0	150	145.5	50.8	49.2	65.66	53.0	12.66	80.7	19.3	3000	2910	44.2		
9	R. L. Patton.....	280	106	43	245	.87	40	235	5	0	141	129.5	52.0	48.0	59.40	51.0	8.40	86.0	14.0	2820	2590	43.6		
10	Lippard's Improved.....	273	108	48	268	.98	30	218	25	0	148	130.0	53.3	46.7	62.40	52.0	10.40	83.3	16.7	2960	2600	41.6		
11	Wyatt's Improved Yellow.....	260	106	44	224	.86	38	218	3	0	134	128.0	51.0	49.0	61.30	50.0	11.30	81.5	18.5	2680	2560	41.6		
12	Wannamaker's Two-Ear.....	284	118	57	292	1.02	30	216	38	0	187	133.5	58.4	41.6	64.00	50.0	14.00	78.0	22.0	3740	2670	41.6		
13	Biggs' Seven-Ear.....	295	108	47	464	1.57	11	113	162	9	137	141.0	49.3	50.7	68.50	52.5	16.00	76.7	23.3	2740	2820	41.2		
14	Batts' Four-Ear.....	265	103	49	311	1.17	7	205	53	0	139	133.0	51.0	49.0	65.00	52.0	13.00	80.0	20.0	2780	2660	40.8		
15	Boone County White.....	258	109	44	206	.79	54	202	2	0	132	117.0	53.0	47.0	57.50	46.0	11.50	80.0	20.0	2640	2340	40.6		
16	McNealy.....	274	113	52	214	.78	62	210	2	0	156	117.5	57.0	43.0	58.25	47.0	11.25	80.7	19.3	3120	2350	40.0		
17	Goodman's Prolific.....	271	110	46	263	.97	35	209	27	0	147	117.0	55.7	44.3	60.20	51.0	9.20	84.7	15.3	2970	2340	38.8		
18	Coker's Williamson.....	267	123	64	258	.96	28	220	19	0	171	112.5	60.0	40.0	59.25	46.0	13.25	77.6	22.4	3420	2250	38.0		
19	F. McL. Patton.....	273	106	42	220	.84	54	218	1	0	141	120.5	46.0	54.0	65.25	53.5	11.75	82.0	18.0	2820	2410	36.8		
20	Marlboro Prolific.....	272	115	59	257	.94	37	213	22	0	163	115.5	58.5	41.5	65.00	51.0	14.00	78.3	21.7	3260	2310	35.4		
21	Hasting's Prolific.....	267	116	60	247	.92	45	197	25	0	181	106.5	63.0	37.0	61.25	49.0	12.25	80.0	20.0	3620	2130	34.8		

In any section there will be found numerous local varieties. A few of the most widely used local varieties in each section were planted along with the best varieties from other sections.

THE BUNCOMBE BRANCH STATION

The Buncombe Branch Station is located in the Swannanoa Valley, 11 miles east of Asheville. The farm has an elevation of 2,400 feet above sea level. According to the preliminary United States Weather Bureau Report* for 1916, the last killing frost in the spring occurred on April 10, and the first killing frost in the following fall was on October 22. (These dates are for Asheville.) The rainfall for the year at Asheville was 37.70 inches, 12.01 inches below normal. About 50 per cent of the total rainfall was fairly well distributed during the growing season, with the exception of July, when the precipitation was 5.14 inches above normal. The soil type upon which the experiment was conducted is classified as Porter's Loam.

In this test three local varieties were included among the twenty-one tested. The varieties and results obtained are shown in Table I; the varieties being listed according to their yield in bushels of shelled grain per acre.

The yields range from 34.8 bushels to 54.0 bushels per acre, a difference of 19.2 bushels. The highest yielding of the local varieties, R. L. Patton, ranked ninth with a yield of 10.4 bushels lower than that of the leading variety.

It is much safer, in determining the best variety for a given locality, to consider the results extending over a number of years, rather than those of a single season. For this reason the compiled results of variety tests at the Buncombe Farm for the past three years are given in Table II. The variety, First Generation Cross No. 182, is a variety that has been obtained by careful selection from the hybrid produced by crossing Hickory King and Boone County White. This work was done by the United States Department of Agriculture. Among the twelve varieties compared, this variety has led with an average yield of 42.7 bushels per acre. This is an increase of 11.2 bushels over the lowest ranking variety, Marlboro Prolific.

THE IREDELL BRANCH STATION

The Iredell Branch Station is located in the western portion of the Piedmont section, 2 miles northwest of Statesville. The rainfall for the year was 48.00 inches, an increase of 3.01 above normal. About 57 per cent of this fell during the growing season. During the month of July 17.16 inches of rain fell. This unusual amount of rain at this time undoubtedly reduced the yields of all varieties. The soil type for this farm is classified as Cecil Clay Loam.

*U. S. Weather Bureau, Climatological Data.

TABLE II—COMPILED RESULTS OF VARIETY TESTS OF CORN—
BUNCOMBE BRANCH STATION.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Yield Per Acre							
		1914		1915		1916		Average for Three Years	
		Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn
1	First Generation Cross No. 182	1900	35.7	1500	38.4	2740	54.0	2046.6	42.7
2	Latham's Double	2025	26.6	2840	50.6	3860	48.0	2908.3	41.7
3	Southern Beauty	1725	20.3	1780	47.4	2940	48.0	2148.3	38.6
4	Weekley's Improved	2570	28.5	1900	38.4	3400	48.2	2623.3	38.4
5	Parker's Prolific	1900	29.4	1520	37.8	3120	47.2	2180.0	38.1
6	Deaton's Favorite	2875	25.3	2520	43.4	3200	44.6	2865.0	37.8
7	Goodman's Prolific	2150	33.4	1580	35.6	2970	38.8	2233.3	35.9
8	Boone County White	1250	35.5	1200	31.2	2640	40.6	1696.6	35.8
8	Jarvis' Golden Prolific	1675	27.5	1600	34.4	3060	45.4	2111.7	35.8
9	Wannamaker	2350	28.5	2460	35.6	3740	41.6	2850.0	35.2
10	Biggs' Seven-Ear	2075	28.2	1540	32.2	2740	41.2	2118.3	33.9
11	Batts' Four-Ear	2050	20.6	2080	36.8	2780	40.8	2303.3	32.7
12	Marlboro Prolific	1975	24.6	1980	34.4	3260	35.4	2405.0	31.5

Twenty-one varieties of corn were planted, seven of which were from Iredell or adjoining counties. The varieties and results obtained are listed in Table III. Among the local varieties tested will be found the variety having the highest yield and also the one having the lowest yield in the entire test. These local varieties have been tested for only one year, and will have to be tried in a number of tests before their rank is established. The yields show a range between 38.50 and 55.00 bushels per acre, a difference of 16.50 bushels. This difference, considered in dollars and cents, shows what a marked difference in returns the growing of the best variety might bring forth.

Table IV contains compiled results from fifteen varieties of corn for the past three years. These results show a range in average yields from 40.15 bushels for Wannamaker to 47.75 bushels for Southern Beauty. The range of yield among the varieties here is not so great as in similar comparisons on other farms.

CENTRAL STATION FARM

The Central Station Farm is located in the eastern portion of the Piedmont section, 2 miles west of Raleigh. The total rainfall for the year was 38.40 inches or 8.80 inches below normal. The soil type at the Central Station Farm is Cecil Sandy Loam.

TABLE III.—VARIETY TESTS OF CORN AT THE IREDELL BRANCH STATION, 1916.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Average Height in Inches at Maturity		Number of Ears	Number of Stalks Bearing—				Yield Per Plat and Related Data (Plat only 1-25 acre, rather than 1-20)						Shelling Capacity				Yield Per Acre			
		Stalks	Ears		Per Plat	Average Per Stalk	Stalks Bearing—				Pounds of Stover	Pounds of Ears	Per Cent Stover	Per Cent Ears	Pounds of Ears to Shell One Bushel	Weight of Measured Bushel of Shelled Corn	Weight of Cobs from Bushel of Shelled Corn	Per Cent Grain	Per Cent Cob	Pounds Stover	Pounds Ears	Bushels of Shelled
				No Ears			One Ear	Two Ears	Three or More Ears													
1	Schoolfield.....	113	49	267	1.02	17	221	23	0	96	131.2	42.00	58.00	60.25	51.50	8.75	85.4	14.6	2400	1287.5	55.00	
2	Kerr's Prolific.....	108	49	260	.99	10	230	15	0	98	122.5	44.50	55.50	61.00	53.50	7.56	87.6	12.4	2450	1062.5	50.00	
3	Southern Beauty.....	231	102	43	254	1.09	7	194	30	80	112.5	41.56	58.44	57.50	51.00	6.50	88.7	11.3	2000	2812.5	48.75	
4	Biggs' Seven-Ear.....	228	107	41	393	1.72	4	67	145	12	77	122.0	38.70	61.30	64.10	54.50	9.60	85.0	15.0	1920	1050.0	47.50
5	Deaton's Two-Ear.....	247	100	46	232	.94	22	218	7	100	114.0	46.70	53.30	58.91	51.25	7.66	87.0	13.0	2500	2850.0	47.50	
6	Latham's Double.....	226	111	49	241	1.06	1	193	24	96	114.0	45.70	54.30	61.50	53.50	8.00	87.0	13.0	2400	2850.0	46.25	
7	Batts' Four-Ear.....	240	105	47	293	1.22	6	176	57	104	121.0	46.23	53.77	65.60	55.00	10.60	83.8	16.2	2600	1025.0	46.00	
8	Weekley's Improved.....	222	100	46	290	1.30	2	150	70	75	116.5	39.20	60.80	63.15	53.25	9.90	84.3	15.7	1870	2012.5	46.00	
9	Parker's Prolific.....	233	99	39	249	1.06	10	197	26	78	116.0	40.20	59.80	64.66	54.00	10.66	83.5	16.5	1950	2000.0	45.25	
10	Southern Snowflake.....	235	102	43	214	.91	22	212	1	76	115.0	42.00	60.00	59.10	50.00	9.10	84.50	15.50	1900	2875.0	45.00	
11	Lewis.....	240	104	47	222	.92	25	209	5	82	110.0	42.70	57.30	61.55	52.75	8.80	85.70	14.30	2050	2750.0	45.00	
12	Wannamaker.....	245	117	57	270	1.10	22	177	45	114	111.5	50.50	49.50	64.50	53.50	11.00	83.00	17.00	2850	2787.5	43.25	
13	Marlboro Prolific.....	237	108	47	246	1.03	12	202	22	90	110.0	45.00	55.00	64.30	54.00	10.30	84.00	16.00	2250	2750.0	43.00	
14	Hastings' Prolific.....	236	117	58	268	1.13	10	166	51	104	104.0	50.00	50.00	60.30	52.50	7.80	87.00	13.00	2600	2600.0	43.00	
15	Wyatt's Improved Yellow.....	230	104	43	218	.94	18	206	6	80	108.0	42.56	57.44	62.66	52.00	10.60	83.00	17.00	2000	2700.0	43.00	
16	Goodman's Prolific.....	225	110	45	253	1.12	8	181	36	84	105.0	44.50	55.50	61.20	54.50	6.70	89.00	11.00	2100	2625.0	42.50	
17	Coker's Williamson.....	219	123	64	222	1.01	16	178	22	100	105.5	43.67	51.33	62.20	51.00	11.20	82.00	18.00	2500	2637.5	42.50	
18	Jarvis' Golden Prolific.....	223	102	41	275	1.23	6	159	58	71	106.5	40.00	60.00	63.80	55.50	8.30	87.00	13.00	1770	2662.5	41.75	
19	Cocke's Prolific.....	233	107	46	288	1.24	6	165	62	86	108.0	44.40	55.60	65.00	54.00	11.00	83.00	17.00	2150	2700.0	41.50	
20	First Generation Cross No. 182.....	218	105	43	206	.94	15	198	4	68	100.5	40.40	59.60	60.40	51.00	9.40	84.40	15.60	1700	2512.5	41.00	
21	Currituck.....	240	110	49	217	.90	25	213	2	95	90.5	51.20	48.80	58.55	50.25	8.30	85.80	14.20	2375	2262.5	38.50	

TABLE IV—COMPILED RESULTS OF VARIETY TESTS OF CORN—
IREDELL BRANCH STATION.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Yield Per Acre							
		1914		1915		1916		Average for Three Years	
		Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn
1	Southern Beauty.....	1890	34.9	4980	59.6	2000	48.75	2956.7	47.75
2	Jarvis' Golden Prolific.....	1905	36.1	4740	60.8	1775	41.75	2806.7	46.21
3	Biggs' Seven-Ear.....	2160	40.2	3780	50.0	1925	47.50	2621.7	45.90
4	Latham's Double.....	3450	32.6	7360	55.4	2400	46.25	4403.3	44.75
5	Parker's Prolific.....	2085	34.3	4660	54.4	1950	45.25	2898.3	44.65
6	First Generation Cross No. 182	1650	33.6	3880	57.8	1700	41.50	2410.0	44.30
6	Weekley's Improved.....	2130	33.7	4940	53.2	1875	46.00	2981.7	44.30
7	Batts' Four-Ear.....	2370	30.2	5580	56.0	2600	46.00	3516.7	44.07
8	Goodman's Prolific.....	2700	36.1	5800	51.2	2100	42.50	3533.3	43.30
9	Coker's Williamson.....	2550	27.6	5060	58.2	2500	42.50	3370.0	42.77
10	Cocke's Prolific.....	1860	34.0	4360	52.4	2150	41.50	2790.0	42.60
11	Marlboro Prolific.....	2355	31.4	6060	52.4	2250	43.00	3555.0	42.30
12	Deaton's Two-Ear.....	2160	22.5	5120	54.2	2500	47.50	3260.0	41.40
13	Southern Snowflake.....	1980	21.7	4940	56.8	1900	45.00	2940.0	41.17
14	Wannamaker.....	2880	22.0	6700	55.2	2850	43.25	4143.3	40.15

The plat used for the variety test is uniform throughout, but in a very low state of fertility—hence the low yields. However, this does not materially lessen the accurateness of a comparison of varieties.

Twenty-five varieties were planted, four of which are local. Table V gives the names of the varieties and results obtained from their comparison. There is here a wide range in yields, the highest variety yielding over three times as many bushels as the lowest. The four local varieties ranked ninth, twenty-first, twenty-third, and twenty-fifth.

The averages of thirteen varieties for three years are given in Table VI. Biggs' Seven-Ear leads with an average of 22.9 bushels per acre, which is almost twice as much as the lowest.

THE GRANVILLE BRANCH STATION

The Granville Branch Station is located in the northeastern portion of the Piedmont section, 1 mile southwest of Oxford. The total rainfall at Henderson, 14 miles east of Oxford, was 39.20 inches, this amount being 9.90 inches below normal. The soil on the Granville Farm is of the Durham Sandy Loam type.

Nineteen varieties were used in this test, none of which are local varieties. The yields were very good and were obtained upon a uni-

TABLE V—VARIETY TESTS OF CORN AT THE CENTRAL STATION FARM, 1916.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Average Height in Inches at Maturity		Number Ears		Number of Stalks Bearing—				Yield Per Plat and Related Data					Shelling Capacity					Yield Per Acre		
		Stalks	Ears	Per Plat	Average Per Stalk	Stalks Bearing—			Pounds of Stover	Pounds of Ears	Per Cent Stover	Per Cent Ears to Shell One Bushel	Weight of Measured Corn	Weight of Cobs from Bushel of Shelled Corn	Per Cent Grain	Per Cent Cob	Pounds Stover	Pounds Ears	Bushels of Shelled Corn			
						No Ears	One Ear	Two Ears														Three or More Ears
1	Latham's Double.....	114	50	232	.84	49	218	7	0	136	60.0	69.3	30.7	60.14	54.00	6.14	89.7	10.3	2720	1200	19.8	
2	Biggs' Seven-Ear.....	105	48	317	1.14	19	203	54	2	97	65.0	60.0	40.0	67.70	56.00	11.70	82.7	17.3	1940	1300	19.2	
3	Southern Beauty.....	108	48	227	.86	43	213	7	0	116	54.0	68.0	32.0	60.72	52.50	8.12	86.6	13.4	2320	1080	17.8	
4	Lippard's Improved.....	103	46	205	.76	64	201	2	0	99	57.5	63.0	37.0	65.85	55.00	10.85	83.5	16.5	1980	1150	17.4	
5	Weekley's Improved.....	103	45	247	.90	31	233	7	0	100	53.5	65.0	35.0	65.55	55.25	10.30	84.3	15.7	2000	1070	16.2	
6	Weller.....	95	42	210	.77	62	208	1	0	116	54.0	68.0	32.0	67.12	56.00	11.12	83.4	16.6	2320	1080	16.0	
7	First Generation Cross No. 182.....	104	44	199	.72	78	195	2	0	107	51.0	67.7	32.3	64.14	53.00	11.14	82.6	17.4	2140	1020	16.0	
8	Jarvis' Golden Prolific.....	94	39	228	.82	60	202	13	0	97	52.5	64.8	35.2	66.95	57.25	9.70	85.5	14.5	1940	1050	15.6	
9	Parker's Prolific.....	97	43	224	.81	59	206	9	0	104	53.5	66.0	34.0	68.70	56.00	12.70	81.5	18.5	2080	1070	15.6	
10	Cocke's Prolific (Holloman).....	268	117	57	245	.91	39	213	16	0	116	54.0	68.0	32.0	69.36	55.50	13.86	80.0	20.0	2320	1080	15.6
11	Marlboro Prolific (Excl. Seed F'rm).....	275	112	56	238	.86	47	219	8	1	118	51.0	70.0	30.0	65.80	55.00	10.80	83.6	16.4	2360	1020	15.6
12	Batts' Four-Ear.....	269	107	51	233	.86	47	211	11	0	111	50.0	69.0	31.0	65.05	55.50	9.55	85.3	14.7	2220	1000	15.4
13	Garriek.....	258	111	52	238	.92	26	226	6	0	128	53.5	70.5	29.5	70.75	55.75	15.00	78.6	21.4	2560	1070	15.0
14	Cocke's Prolific (Edgecombe).....	266	111	52	245	.92	34	219	13	0	106	51.0	67.5	32.5	69.10	56.00	13.10	81.0	19.0	2120	1020	14.8
15	Goodman's Prolific.....	273	111	50	212	.77	66	202	5	0	111	47.0	70.0	30.0	64.73	56.00	8.73	86.5	13.5	2220	940	14.6
16	Marlboro Prolific (Ped. Seed Co.).....	274	111	53	242	.88	44	220	10	0	120	49.0	71.0	29.0	69.36	55.50	13.86	80.0	20.0	2400	980	14.2
17	Hastings' Prolific.....	271	114	53	214	.78	69	190	12	0	122	45.0	73.0	27.0	64.55	55.25	9.30	85.6	14.4	2440	900	14.0
18	Coker's Williamson.....	266	117	58	225	.84	52	203	11	0	117	45.0	72.2	27.8	64.45	53.50	10.95	83.0	17.0	2340	900	14.0
19	Cocke's Prolific (Hunter).....	273	98	40	222	.81	55	214	4	0	86	45.0	65.6	34.4	66.10	54.00	12.10	81.6	18.4	1720	900	13.6
20	Wanamaker.....	265	117	59	233	.87	44	209	12	0	118	42.5	73.5	26.5	62.20	53.25	8.95	85.6	14.4	2360	850	13.6
21	Hunt's Prolific.....	278	95	42	197	.70	82	195	1	0	94	44.0	68.0	32.0	66.40	55.25	11.15	83.2	16.8	1880	880	13.2
22	Expr. Station Yellow, No. 944.....	264	100	46	231	.87	37	223	4	0	112	46.5	70.6	29.4	72.30	59.00	13.30	81.5	18.5	2210	930	12.8
23	Wyatt's Improved Yellow.....	267	103	43	201	.75	67	199	1	0	108	36.5	74.7	25.3	64.33	52.50	11.83	81.6	18.4	2160	730	11.4
24	Henry Grady.....	270	113	53	166	.61	104	166	0	0	121	26.5	82.0	18.0	65.40	53.50	11.90	81.8	18.2	2420	530	8.0
25	White Crystallian.....	265	112	49	133	.50	132	133	0	0	130	20.0	86.0	14.0	68.70	53.20	15.45	77.5	22.5	2600	400	5.8

TABLE VI—COMPILED RESULTS OF VARIETY TESTS OF CORN—
CENTRAL STATION FARM.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Yield Per Acre							
		1914		1915		1916		Average for Three Years	
		Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn
1	Biggs' Seven-Ear.....	2360	16.8	1990	32.8	1940	19.2	2096.6	22.9
2	First Generation Cross No. 182.....	2080	21.1	1420	22.6	2140	16.0	1880.0	19.9
3	Southern Beauty.....	1920	13.3	2045	28.0	2320	17.8	2095.0	19.7
4	Weekley's Improved.....	2000	12.0	2130	29.0	2000	16.2	2043.3	19.1
5	Parker's Prolific.....	2240	13.1	1905	26.4	2080	15.6	2075.0	18.4
6	Batts' Four-Ear.....	2380	8.8	2190	30.4	2220	15.4	2263.3	18.2
7	Cocke's Prolific.....	2240	13.3	1660	24.0	2120	14.8	2006.6	17.4
8	Jarvis' Golden Prolific.....	1880	13.5	1570	21.8	1940	15.6	1796.6	17.0
9	Latham's Double.....	2400	8.2	1820	22.0	2720	19.8	2313.3	16.7
10	Goodman's Prolific.....	2160	8.2	2005	24.6	2220	14.6	2128.3	15.8
11	Marlboro Prolific.....	2520	9.8	1700	19.0	2360	15.6	2193.3	14.8
12	Wannamaker.....	2440	9.1	1815	17.6	2360	13.6	2205.0	13.4
13	Coker's Williamson.....	2360	6.3	1745	16.0	2340	14.0	2148.3	12.1

TABLE VIII—COMPILED RESULTS OF VARIETY TESTS OF CORN—
GRANVILLE BRANCH STATION.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Yield Per Acre					
		1915		1916		Average for Two Years	
		Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn
1	Biggs' Seven-Ear.....	1180	26.2	2200	56.2	1690	41.2
2	Batts' Four-Ear.....	1460	27.8	2040	42.4	1750	35.1
3	Latham's Double.....	1640	28.2	1920	41.8	1780	35.0
4	Deaton's Two-Ear.....	1380	28.0	2280	41.6	1830	34.8
5	Eureka.....	1820	30.4	2340	38.6	2080	34.5
6	First Generation Cross No. 182.....	1010	23.8	1680	44.0	1345	33.9
6	Goodman's Prolific.....	1160	24.6	1760	43.2	1460	33.9
7	Cocke's Prolific.....	1120	22.8	1760	42.6	1440	32.7
8	Weekley's Improved.....	1210	26.0	1920	38.6	1580	32.3
9	Lippard's Improved.....	1180	27.0	1480	37.0	1330	32.0

form plat. Table VII shows that for 1916 Biggs' Seven-Ear ranked first. The yields varied between 30.0 and 56.2 bushels per acre, a difference of 26.2 bushels.

In a two year average with ten varieties (Table VIII) the yields range between 32.0 and 41.2 bushels per acre. Since these results are

TABLE VII—VARIETY TESTS OF CORN AT THE GRANVILLE BRANCH STATION, 1916.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Average Height in Inches at Maturity		Number Ears		Number of Stalks Bearing—				Yield Per Plat and Related Data						Shelling Capacity				Yield Per Acre		
		Stalks	Ears	Per Plat	Average Per Stalk	Number of Stalks Bearing—				Pounds of Stover	Pounds of Ears	Per Cent Stover	Per Cent Ears	Pounds of Ears to Shell One Bushel	Weight of Measured Bushel of Shelled Corn	Weight of Cobs from Bushel of Shelled Corn	Per Cent Grain	Per Cent Cob	Pounds Stover	Pounds Ears	Bushels of Shelled Corn	
						No Ears	One Ear	Two Ears	Three or More Ears													
1	Biggs' Seven-Ear.....	---	---	478	1.94	6	63	126	51	110.0	191.5	36.50	63.50	68.00	57.00	11.00	83.85	16.15	2200	3830	56.2	
2	First Generation Cross, No. 182.....	---	---	240	1.00	3	205	16	1	84.0	139.0	37.60	62.34	68.20	52.00	11.20	82.20	17.80	1680	2780	44.0	
3	Goodman's Prolific.....	---	---	334	1.41	7	103	111	3	88.0	138.0	38.93	61.07	63.75	55.00	8.75	86.23	13.77	1760	2760	43.2	
4	Cooke's Prolific.....	---	---	320	1.50	3	84	115	2	88.0	145.0	37.75	62.25	68.00	56.25	11.80	82.66	17.34	1760	2900	42.6	
5	Batts' Four-Ear.....	---	---	334	1.50	2	116	95	1	102.0	147.0	41.00	59.00	69.00	55.50	13.55	80.35	19.65	2040	2940	42.4	
6	Latham's Double.....	---	---	281	1.2	4	163	59	0	96.0	133.0	41.92	58.08	63.60	54.00	9.60	84.93	15.07	1920	2660	41.8	
7	Deaton's Two-Ear.....	---	---	241	1.02	13	205	18	0	114.0	133.0	46.15	53.85	63.70	54.00	9.70	84.77	15.23	2280	2660	41.6	
8	Parker's Prolific.....	---	---	309	1.21	5	187	63	0	84.0	130.0	39.27	60.75	66.10	54.00	12.10	81.58	18.42	1680	2600	39.2	
9	Eureka.....	---	---	285	1.08	14	215	35	0	117.0	132.0	47.00	53.00	68.60	54.50	14.10	79.41	20.59	2340	2640	38.6	
10	Weekley's Improved.....	---	---	292	1.22	9	164	64	0	96.0	127.0	43.00	57.00	65.70	55.00	10.70	83.70	16.30	1920	2540	38.6	
11	Jarvis' Golden Prolific.....	---	---	341	1.30	10	125	108	0	82.0	128.0	39.00	61.00	66.90	56.50	10.40	84.47	15.53	1640	2560	38.2	
12	Southern Beauty.....	---	---	301	1.14	8	207	46	0	84.0	112.0	42.85	57.15	60.00	52.00	8.00	86.70	13.30	1680	2240	37.2	
13	Lippard's Improved.....	---	---	259	1.12	15	175	39	0	74.0	113.0	39.57	60.43	61.20	53.00	8.20	86.66	13.34	1480	2260	37.0	
14	Hastings' Prolific.....	---	---	253	1.42	9	61	96	0	94.0	110.0	46.00	54.00	62.45	53.25	9.20	85.26	14.74	1880	2200	35.2	
15	Marlboro Prolific.....	---	---	254	1.20	11	142	56	0	91.0	118.0	43.54	56.46	67.40	55.00	12.40	81.56	18.44	1820	2360	35.0	
16	Wyatt's Improved Yellow.....	---	---	229	1.01	14	165	17	0	74.0	114.0	39.37	60.63	67.10	54.50	12.60	81.18	18.82	1480	2280	34.0	
17	Columbia Beauty.....	---	---	212	.95	14	204	4	0	74.0	104.0	41.57	58.43	61.00	52.00	9.60	84.37	15.63	1480	2080	33.6	
18	Wannamaker.....	---	---	287	1.25	12	145	71	0	106.0	113.0	48.40	51.60	68.00	55.00	13.00	80.90	19.10	2120	2260	33.2	
19	Coker's Williamson.....	---	---	224	1.40	5	86	69	0	70.0	97.0	41.90	58.10	65.05	53.25	11.80	81.86	18.14	1400	1940	30.0	

TABLE IX.—VARIETY TESTS OF CORN AT THE EDGECOMBE BRANCH STATION, 1916.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Average Height in Inches at Maturity		Number Ears		Number of Stalks Bearing—				Yield Per Plat and Related Data					Shelling Capacity					Yield Per Acre		
		Stalks	Ears	Per Plat	Average Per Stalk	No Ears	One Ear	Two Ears	Three or More Ears	Pounds of Stover	Pounds of Ears	Per Cent Stover	Per Cent Ears	Pounds of Ears to Shell One Bushel of Corn	Weight of Shelled Bushel of Corn	Weight of Cobs from Bushel of Shelled Corn	Per Cent Grain	Per Cent Cob	Pounds Stover	Pounds Ears	Bushels of Shelled Corn	
1	Biggs' Seven-Ear.....	253	97	33	523	2	63	129	35	94.0	190.5	33.05	66.95	65.00	55.50	9.50	85.40	14.60	1880	3810	58.6	
2	Coker's Williamson.....	253	111	54	292	1.15	10	194	49	0	128.0	165.5	43.62	56.38	61.76	53.00	8.76	85.80	14.20	2560	3310	53.6
3	Goodman's Prolific.....	258	98	40	361	1.40	7	144	104	8	103.0	163.0	38.73	61.27	61.07	53.75	7.32	88.00	12.00	2060	3260	53.2
4	Hastings' Prolific.....	235	103	48	348	1.48	9	112	106	8	127.5	159.0	44.50	55.50	62.94	54.50	8.44	86.60	13.40	2550	3180	50.4
5	Latham's Double.....	252	102	45	281	1.11	3	217	32	0	130.0	152.0	46.10	53.90	61.92	54.25	7.67	87.60	12.40	2600	3040	49.0
6	Coker's Prolific.....	260	104	39	367	1.41	8	139	111	2	105.0	160.0	39.63	60.37	65.87	56.00	9.87	85.00	15.00	2100	3200	48.6
7	Richardson.....	249	98	40	380	1.52	3	126	106	14	104.0	163.5	38.88	61.12	67.65	57.25	10.40	84.60	15.40	2080	3270	48.2
8	Gerrick's Prolific.....	253	106	49	337	1.33	14	147	86	6	128.0	157.5	44.84	55.16	68.23	56.50	11.73	82.80	17.20	2560	3150	46.0
9	Weekley's Improved.....	243	94	39	331	1.36	8	139	96	0	103.5	149.5	41.00	59.00	65.35	55.75	9.60	85.30	14.70	2070	2990	45.6
10	Jarvis' Golden Prolific.....	245	90	35	341	1.39	3	146	93	3	87.0	147.5	37.10	62.90	65.15	56.75	8.40	87.10	12.90	1740	2950	45.2
11	Lippard's Improved.....	243	102	40	304	1.25	6	171	65	1	86.0	139.0	38.23	61.77	61.65	54.50	7.15	88.40	11.60	1720	2780	45.0
12	Deaton's Two-Ear.....	254	101	46	241	.94	26	215	13	0	116.0	138.0	45.67	54.33	61.50	53.75	7.75	87.40	12.60	2320	2760	44.8
13	First Generation Cross, No. 182.....	246	95	38	250	1.01	9	224	13	0	70.0	139.0	33.50	66.50	62.12	52.25	9.87	84.10	15.90	1400	2780	44.6
14	Wannamaker.....	252	108	52	312	1.23	11	171	68	1	137.5	148.0	48.17	51.83	67.46	56.00	11.46	83.00	17.00	2750	2960	43.8
15	Parker's Prolific.....	259	88	35	308	1.18	10	190	59	0	96.0	146.0	39.67	60.33	66.70	55.50	11.20	83.20	16.80	1920	2920	43.6
16	Wright's Prolific.....	246	97	44	304	1.23	11	172	58	5	95.5	136.5	41.17	58.83	62.56	54.00	8.56	86.30	13.70	1910	2730	43.6
17	Marlboro Prolific.....	252	103	47	292	1.15	15	185	40	3	122.0	139.5	46.58	53.42	64.38	55.50	8.88	86.20	13.80	2440	2790	43.2
18	Southern Beauty.....	235	96	41	273	1.16	9	179	47	0	84.5	127.0	40.00	60.00	59.32	52.50	6.82	88.50	11.50	1690	2540	42.8
19	Weller.....	244	97	38	284	1.16	10	184	50	0	89.0	141.0	38.70	61.30	66.01	55.25	10.76	83.70	16.30	1780	2820	42.6
20	Gray Brown.....	255	98	42	271	1.06	11	217	27	0	99.0	133.0	42.68	57.32	62.64	54.50	8.14	87.00	13.00	1980	2660	42.4
21	Bland.....	224	98	41	292	.99	18	190	16	0	91.5	126.0	42.07	57.93	60.91	52.75	8.16	86.60	13.40	1830	2520	41.2
22	Killebrew's.....	235	100	46	219	.97	25	201	9	0	100.0	123.0	45.00	55.00	64.35	54.25	10.10	84.30	15.70	2000	2460	38.2
23	Batts' Four-Ear*.....	121	106	49	127	1.05	9	97	15	0	50.0	56.0	47.17	52.83	65.04	55.00	10.04	84.40	15.60	2000	2240	34.4

*One-half the corn of this variety was cut by mistake before data were taken; therefore data relating to the plat work are only for one-fortieth of an acre, rather than one-twentieth.

for only two years, the relative rank of varieties will be more conclusive after further tests have been made.

THE EDGECOMBE BRANCH STATION

The Edgcombe Branch Station is located in the upper western portion of the Coastal Plain, 7 miles southeast of Rocky Mount. The total rainfall at the farm was 50.93 inches. About 50 per cent of the total rainfall was well distributed throughout the growing season, with the exception of heavy rains during the latter part of May. The soil type at this farm is Norfolk Sandy Loam.

Table IX shows the twenty-three varieties tested and the results obtained. Among these varieties were four local varieties, Biggs' Seven-Ear, Weller, Gray Brown, and Killibrew. Their rank in the order named was first, nineteenth, twentieth, and twenty-second. There was a wide difference in yields, ranging between 34.4 and 58.6 bushels per acre.

Table X gives the three year averages of fifteen varieties. A local prolific variety, Biggs' Seven-Ear, leads in this average with a yield of 53.9 bushels.

TABLE X—COMPILED RESULTS OF VARIETY TESTS OF CORN—
EDGECOMBE BRANCH STATION.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Yield Per Acre							
		1914		1915		1916		Average for Three Years	
		Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn	Pounds of Stover	Bushels of Shelled Corn
1	Biggs' Seven-Ear.....	3030	39.8	3555	63.2	1880	58.6	2821.7	53.9
2	Latham's Double.....	4420	35.2	4085	63.4	2600	49.0	3701.7	49.2
3	Goodman's Prolific.....	4060	35.8	3175	57.4	2060	53.2	3098.3	48.8
4	Coker's Williamson.....	4240	33.3	4040	59.0	2560	53.6	3613.3	48.6
5	Weekley's Improved.....	5190	37.6	3665	60.8	2070	45.6	3641.7	48.0
6	Marlboro Prolific.....	4600	36.4	4140	62.4	2440	43.2	3726.7	47.3
7	Jarvis' Golden Prolific.....	4030	35.5	3680	61.0	1740	45.2	3150.0	47.2
8	Cooke's Prolific.....	3480	31.9	3450	60.0	2100	48.6	3010.0	46.8
9	First Generation Cross No. 182	3020	40.5	2565	53.8	1400	44.6	2328.3	46.3
10	Gerrick's Prolific.....	4800	30.5	4540	61.2	2560	46.0	3966.7	45.9
11	Southern Beauty.....	4200	34.1	3120	59.6	1690	42.8	3003.3	45.5
12	Wannamaker.....	4780	31.0	3890	57.4	2750	43.8	3806.7	44.1
13	Parker's Prolific.....	4000	32.5	3110	55.2	1920	43.6	3010.0	43.8
14	Deaton's Two-Ear.....	2820	34.0	3730	52.4	2320	44.8	2956.7	43.7
15	Batts' Four Ear.....	4480	30.6	3790	57.2	2000	34.4	3423.3	40.7

TABLE XI.—VARIETY TESTS OF CORN AT THE WASHINGTON BRANCH STATION, 1916.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Average Height in Inches at Maturity		Number of Ears		Number of Stalks Bearing—				Yield Per Plat and Related Data				Shelling Capacity				Yield Per Acre			
		Stalks	Ears	Per Plat	Average Per Stalk	No Ear	One Ear	Two Ears	Three or More Ears	Pounds of Stover	Pounds of Ears	Per Cent Stover	Per Cent Ears	Pounds of Ears to Shell One Bushel	Weight of Measured Bushel of Shelled Corn	Weight of Cob from Bushel of Shelled Corn	Per Cent Grain	Per Cent Cob	Pounds Stover	Pounds Ears	Bushels of Shelled Corn
1	Marlboro Prolific.....	114	54	286	1.11	8	216	38	0	119.0	148.0	44.5	55.5	64.56	56.5	8.04	87.50	12.50	2380	2860	45.8
2	Wannamaker.....	117	58	332	1.30	11	166	80	4	99.0	152.0	39.4	60.6	89.90	58.0	11.90	83.00	17.00	1980	3010	43.4
3	Tom Green.....	116	50	311	1.12	4	221	41	0	155.0	143.0	52.0	48.0	67.16	55.5	11.64	82.60	17.40	3100	2860	42.4
4	Horse Tooth.....	113	55	285	1.10	20	172	57	0	123.0	142.0	46.4	53.6	67.25	56.5	10.75	84.00	16.00	2460	2840	42.2
5	Parker's Prolific.....	105	44	270	1.08	7	214	28	0	102.5	139.0	42.4	57.6	68.10	57.5	10.64	84.40	15.60	2050	2780	40.8
6	Southern Beauty.....	108	50	288	1.20	16	170	53	0	118.2	128.7	47.8	52.2	64.66	56.0	8.64	86.60	13.40	2367	2571	40.0
7	Latham's Double.....	115	54	291	1.05	6	247	21	0	97.7	117.2	45.4	54.6	65.46	55.0	10.44	84.00	16.00	1955	2345	36.0
8	Jarvis' Golden Prolific.....	113	40	233	1.03	8	171	28	0	83.2	111.7	42.0	57.4	66.66	58.0	8.64	87.00	13.00	1665	2235	33.4
9	Radcliff.....	111	49	285	1.15	7	196	45	1	109.0	104.0	51.1	48.9	65.30	55.5	9.80	85.00	15.00	2180	2080	31.8
10	Weekley's Improved.....	105	50	244	1.02	22	185	21	1	110.0	106.0	50.1	49.1	67.70	56.5	11.20	83.50	16.50	2200	2124	31.2
11	First Generation Cross, No. 182.....	227	109	59	.96	1	201	1	0	47.2	87.2	35.1	64.9	65.66	55.0	10.66	83.75	16.25	945	1747	26.6
12	Batts' Four-Ear.....	215	44	207	.95	26	171	10	0	78.5	80.5	49.3	50.7	61.03	52.0	9.03	85.20	14.80	1570	1610	26.4
13	Cooke's Prolific.....	200	100	41	1.23	12	134	41	5	63.0	86.5	42.1	57.9	67.00	58.0	9.00	86.60	13.40	1260	1790	26.0
14	Hastings' Prolific.....	161	100	48	1.07	10	128	22	0	51.0	77.5	39.4	60.4	61.00	55.0	6.60	89.30	10.70	1020	1590	25.0
15	Biggs' Seven-Ear.....	195	95	45	2.01	13	121	67	2	67.2	80.2	45.5	54.5	67.07	55.0	12.07	82.00	18.00	1345	1607	24.0
16	Southern Snowflake.....	172	111	56	1.11	16	133	29	0	51.7	74.7	40.1	59.1	67.97	56.0	11.97	82.40	17.60	1035	1497	22.0
17	Coker's Williamson.....	222	106	49	.96	11	192	11	0	60.0	71.0	46.0	54.0	64.30	54.0	10.30	84.00	16.00	1200	1420	22.0
18	Goodman's Prolific.....	215	94	226	1.05	12	181	21	1	52.5	67.0	44.0	56.0	63.00	53.0	10.00	84.00	16.00	1050	1340	21.2

THE WASHINGTON BRANCH STATION

The Washington County Branch Station is located in the northeastern portion of the Coastal Plain, about 11 miles north of Belhaven. The rainfall for the year was 48.61 inches. Sixty per cent of this fell uniformly throughout the growing period. The Washington Station is on the newly cleared muck lands of this section. The muck extends down two or three feet to a fine sandy clay subsoil.

It is somewhat difficult to obtain a fair comparison of varieties here as there are certain spots in the plat which will not grow corn.

There were eighteen varieties tested on the Washington Farm in 1916, four of which are local varieties. The yields ranged between 21.2 and 45.8 bushels per acre, a difference of 24.6 bushels. The local corns Tom Green, Horse Tooth, Latham's Double, and Radcliff, all ranked among the nine highest.

On this same type of muck soil a coöperative test was made with Mr. R. W. Howell at Terra Ceia. The test here was uniform throughout and a good stand was secured with all of the varieties. The yields ranged between 57.2 and 71.2 bushels per acre. The two leading varieties listed in Table XII are local varieties. The other local variety, Tom Green, ranked fifth with a yield of 62.2 bushels.

The results obtained at the Washington Test Farm and at Terra Ceia show that Latham's Double, Wannamaker, Marlboro Prolific, Horse Tooth, and Tom Green do well on this muck soil.

A coöperative test was also conducted with Mr. Joseph Berry at Elizabeth City, on the farm of Dr. J. H. White. Two of the eight varieties tested were local. The four leading varieties in their relative order are Latham's Double, Perry's Improved (local), Biggs' Seven-Ear, and Coker's Prolific.

COMPARISON OF CORN VARIETIES FOR SILAGE

The best variety of corn for silage in any community is the corn which produces the largest quantity of digestible food per acre. This may or may not be the variety which produces the largest quantity of silage. It is a common practice to judge silage corns by the quantity produced rather than by the quantity of digestible food produced per acre. The food value of silage depends, to a large extent, upon the quantity of ears cut. According to Henry* the ears contain 63 per cent and the stalks and leaves 37 per cent of the total digestible nutrients in silage. This means that 100 pounds of ears cut into silage is equal in food value to 170 pounds of stalks and leaves cut for silage.

In the study of corn varieties one finds certain varieties which make a large growth of stalks and leaves and produce a small quantity of grain. Some of these varieties have become popular as silage corns. Among the corn varieties studied during the past season were some

*Henry, W. A., "Feeds and Feeding," p. 169.

TABLE XII—VARIETY TESTS OF CORN AT TERRA CEIA, BEAUFORT COUNTY, 1916.

Rank According to Yield Per Acre in Bushels of Shelled Corn	Varieties	Number of Stalks Per Plot by Actual Count		Number Ears		Number of Stalks Bearing—				Yield Per Plot and Related Data		Shelling Capacity				Yield Per Acre	
		Per Plot	Average Per Stalk	No Ears	One Ear	Two Ears	Three or More Ears	Pounds of Ears to Shell One Bushel of Corn	Weight of Measured Bushel of Shelled Corn	Weight of Cobs from Bushel of Shelled Corn	Per Cent Grain	Per Cent Cob	Pounds Ears	Bushels of Shelled Corn	Per Cent Grain	Per Cent Cob	Bushels of Shelled Corn
1	Latham's Double.....	280	1.33	2	181	97	0	224.0	62.75	55.25	7.50	88.00	12.00	4180	71.2	12.00	71.2
2	Horse Tooth.....	249	1.11	1	218	30	0	217.0	65.12	55.75	9.37	85.63	14.37	4340	66.6	14.37	66.6
3	Wannamaker.....	282	1.73	0	85	186	11	222.5	69.82	57.12	12.70	81.80	18.20	4450	63.6	18.20	63.6
4	Coker's Williamson.....	288	1.29	4	206	78	0	212.0	67.37	56.50	10.87	83.94	16.06	4240	63.0	16.06	63.0
5	Tom Green.....	275	1.43	4	151	117	3	209.0	67.12	58.37	8.75	87.00	13.00	4180	62.2	13.00	62.2
6	Weekley's Improved.....	266	1.78	2	70	179	15	213.5	68.50	57.50	11.00	83.94	16.06	4270	62.2	16.06	62.2
7	Biggs' Seven-Ear.....	267	2.28	2	31	149	85	209.0	68.09	57.00	11.09	83.69	16.31	4180	61.2	16.31	61.2
8	Coker's Prolific.....	297	1.60	1	125	162	9	208.5	68.31	58.25	10.06	85.33	14.67	4170	60.8	14.67	60.8
9	Southern Beauty.....	263	1.40	0	158	103	2	182.5	63.75	56.50	7.25	88.60	11.40	3650	57.2	11.40	57.2

which produced only 37 per cent of their total weight in ears while others, grown under the same conditions, produced ears amounting to 54 per cent of their total weight.

Since the feeding of silage is usually supplemented by more concentrated feeds, such as cotton-seed meal, bran, or oats, the richer silage would be an advantage. In the feeding of a more nutritious ensilage less of the expensive concentrated feedstuffs would be necessary.

The following tables contain a list of corn varieties which have yielded best for silage in the different parts of the State. The weights indicate dry stover and ears per acre.

TABLE XIII—COMPARISON OF CORN VARIETIES FOR SILAGE—
BUNCOMBE BRANCH STATION.

For Year 1916					Average for Years 1914-16				
Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre	Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre
*1	Latham's Double.....	3860	2830	6690	*1	Latham's Double.....	2908.3	2740.0	5648.3
2	Weekley's Improved....	3400	3060	6460	2	Weekley's Improved..	2625.0	2673.3	5298.3
3	Parker's Prolific.....	3120	3080	6200	3	Wannamaker's Two- Ear.....	2850.0	2471.7	5321.7
4	First Generation Cross No. 182.....	2740	3280	6020	4	Deaton's Favorite....	2865.0	2398.3	5263.3
5	Wannamaker's Two- Ear.....	3740	2670	6410	5	First Generation Cross No. 182.....	2046.7	2836.7	4883.4
6	Cooke's Prolific.....	3000	2910	5910	6	Parker's Prolific.....	2180.0	2600.0	4780.0
7	Jarvis' Golden Prolific.	3060	2820	5880	7	Goodman's Prolific....	2233.3	2391.7	4625.0
8	Deaton's Two-Ear.....	3200	2610	5810	8	Marlboro Prolific.....	2405.0	2235.0	4640.0

*The varieties are ranked according to their food values.

TABLE XIV—COMPARISON OF CORN VARIETIES FOR SILAGE—
IREDELL BRANCH STATION.

For Year 1916					Average for Years 1914-16				
Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre	Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre
*1	Schoolfield.....	2400	3287.5	5687.5	*1	Latham's Double...	4403.3	2870.0	7273.3
2	Batts' Four-Ear.....	2600	3025.0	5625.0	2	Wannamaker.....	4143.3	2775.8	6919.1
3	Kerr's Prolific.....	2450	3062.5	5512.5	3	Batts' Four-Ear....	3516.7	3001.7	6518.4
4	Wannamaker.....	2850	2787.5	5637.5	4	Marlboro Prolific...	3555.0	2826.7	6381.7
5	Deaton's Two-Ear....	2500	2850.0	5350.0	5	Goodman's Prolific..	3533.3	2785.0	6318.3
6	Latham's Double....	2400	2850.0	5250.0	6	Weekley's Improved	2981.7	3007.5	5989.2
7	Hastings' Prolific....	2600	2600.0	5200.0	7	Coker's Williamson..	3370.0	2769.2	6139.2
8	Coker's Williamson..	2500	2637.5	5137.5	8	Southern Beauty...	2956.7	2987.5	5944.2

*The varieties are ranked according to their food values.

TABLE XV—COMPARISON OF CORN VARIETIES FOR SILAGE—
CENTRAL STATION FARM.

For Year 1916					Average for Years 1914-16				
Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre	Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre
*1	Latham's Double.....	2720	1200	3920	*1	Biggs' Seven-Ear.....	2096.7	1573.3	3670.0
2	Garric.....	2560	1070	3630	2	Batts' Four-Ear.....	2263.3	1250.0	3513.3
3	Southern Beauty.....	2320	1080	3400	3	Weekley's Improved..	2043.3	1360.0	3403.3
3	Weller.....	2320	1080	3400	4	Parker's Prolific.....	2075.0	1281.6	3356.6
3	Cocke's Prolific (Hol- loman).....	2320	1080	3400	5	Southern Beauty.....	2095.0	1251.7	3346.7
4	Marlboro Prolific (Exel. Seed Farm).....	2360	1020	3380	6	Latham's Double.....	2313.3	1076.7	3390.0
5	Marlboro Prolific (Ped. Seed Co.).....	2400	980	3380	7	First Generation Cross No. 182.....	1880.0	1326.7	3206.7
6	Hastings' Prolific.....	2440	900	3340	8	Cocke's Prolific.....	2006.7	1223.3	3230.0

*The varieties are ranked according to their food values.

TABLE XVI—COMPARISON OF CORN VARIETIES FOR SILAGE—
EDGEcombe BRANCH STATION.

For Year 1916					Average for Years 1914-16				
Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre	Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre
*1	Biggs' Seven-Ear.....	1880	3310	5690	*1	Gerrick's Prolific.....	3966.7	3210.0	7176.7
2	Coker's Williamson	2560	3310	5870	2	Weekley's Improved..	3641.7	3338.3	6980.0
3	Hastings' Prolific	2550	3180	5730	3	Marlboro Prolific.....	3726.7	3276.7	7003.4
4	Gerrick's Prolific.....	2560	3150	5710	4	Wannamaker.....	3806.7	3123.3	6930.0
5	Wannamaker's Two- Ear.....	2750	2960	5710	5	Biggs' Seven-Ear.....	2821.7	3695.0	6516.7
6	Latham's Double.....	2600	3040	5640	6	Latham's Double.....	3701.7	3155.0	6856.7
7	Richardson.....	2080	3270	5350	7	Deaton's Two-Ear....	3956.7	2910.0	6930.0
8	Goodman's Prolific	2060	3260	5320	8	Coker's Williamson...	3613.3	3103.3	6716.6

*The varieties are ranked according to their food values.

TABLE XVII—COMPARISON OF CORN VARIETIES FOR SILAGE—
GRANVILLE BRANCH STATION.

For Year 1916					Average for Years 1915-16				
Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre	Rank	Varieties	Pounds of Stover Per Acre	Pounds of Ears Per Acre	Total Weight Per Acre
*1	Biggs' Seven-Ear.....	2200	3830	6030	*1	Biggs' Seven-Ear.....	1690	2830	4520
2	Batts' Four-Ear.....	2040	2940	4980	2	Eureka.....	2080	2430	4510
3	Eureka.....	2340	2640	4980	3	Batts' Four-Ear.....	1750	2100	4150
4	Deaton's Two-Ear.....	2280	2660	4940	4	Deaton's Two-Ear.....	1830	2270	4100
5	Cocke's Prolific.....	1760	2900	4660	5	Latham's Double.....	1780	2290	4070
6	Goodman's Prolific.....	1760	2760	4520	6	Weekley's Improved.....	1580	2200	3780
7	Latham's Double.....	1920	2660	4580	7	Cocke's Prolific.....	1440	2250	3690
8	First Generation Cross No. 182.....	1680	2780	4460	8	Goodman's Prolific.....	1460	2190	3650
9	Weekley's Improved	1920	2540	4460	9	First Generation Cross No. 182.....	1345	2190	3535

*The varieties are ranked according to their food values.

Several of the varieties have stood well in most of the tests. Among these are Biggs' Seven-Ear, Weekley's Improved, Latham's Double, and Southern Beauty. These varieties are also among the best grain producers grown in the State.

SUMMARY

During the past season corn variety tests were conducted on six of the State Branch Experiment Stations. These stations are so distributed as to represent the more important soil types and climatic conditions in the State. Among the forty-two varieties tested was a few of the best varieties from neighboring States, several of the most popular varieties grown in the State, and a few varieties that are grown to considerable extent in certain localities. The results of such tests should furnish growers of that section with reliable information regarding the yielding power of corns grown in the community. As a result of the tests a few growers have already discarded old mixed varieties for seed of the better yielding uniform corns.

The tables contain the detail results of the 1916 tests and compiled results showing the average standing for the past three years. The average results from three years testing should be of service in determining the best varieties for a section. Some of the old varieties such as Marlboro, Biggs' Seven-Ear, Weekley's Improved, and Cocke's Prolific are still standing well in the tests. Among the promising varieties which have only been tested a few years are Latham's Double, First Generation Cross No. 182, and Jarvis Golden Prolific.

The best variety of corn for silage is the one that produces the largest quantity of digestible food per acre. Since the ears contain 63 per cent of the digestible nutrients in silage it is important that an ensilage corn produce a large quantity of ears as well as stalks and leaves.

TABLE XVIII.—CLIMATOLOGICAL DATA.

Station	Monthly Precipitation in North Carolina for 1916— Month of Year												Total Precipitation	Departure from Normal	Date of Last Killing Frost in the Spring	Date of First Frost in the Fall
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.				
Asheville*	2.54	3.73	1.74	1.35	3.00	5.15	9.28	2.80	1.72	2.86	1.36	1.57	37.70	-12.01	April 10	Oct. 22
Iredell Branch Station.....	2.42	5.65	1.71	1.75	2.98	4.49	17.16	2.75	2.47	2.65	1.01	2.96	48.00	+3.01	April 10	Nov. 4
Central Branch Station.....	2.50	3.20	2.03	2.18	3.66	6.47	6.54	5.68	1.36	2.13	0.55	2.10	38.40	-8.80	Mar. 20	Nov. 16
Henderson.....	1.73	3.79	1.72	2.96	2.36	6.10	6.18	5.83	1.74	2.18	1.88	2.74	39.20	-7.90	April 10	Nov. 15
Edgecombe Branch Station.....	4.36	1.00	3.48	4.02	7.61	4.40	6.84	5.55	4.15	3.30	2.02	4.20	50.93	-4.40	April 10	Nov. 4
Washington Branch Station.....	1.80	2.32	2.20	2.02	5.90	7.76	7.42	8.75	3.10	2.15	1.50	3.69	48.61	-----	Mar. 21	Oct. 12
Elizabeth City.....	3.50	4.65	2.21	2.70	3.79	4.15	6.72	3.36	1.82	2.13	1.55	4.49	41.07	-----	Mar. 20	Nov. 4

*NOTE.—In some cases the data for the exact locality of the farm could not be obtained. The figures and dates in such cases are for stations in close proximity to the farm.

SOURCES OF SEED OF CORN VARIETIES FOR THE SEASON OF 1916.

Variety	Source	Postoffice
Batts' Four-Ear.....	J. F. Batts.....	Garner, N. C.
Biggs' Seven-Ear.....	F. P. Shields.....	Scotland Neck, N. C.
Bland.....	R. C. Bland.....	Kerr, N. C.
Boone County White.....	T. W. Wood & Sons.....	Richmond, Va.
Cocke's Prolific.....	Edgecombe Test Farm.....	Rocky Mount, N. C.
Cocke's Prolific.....	L. C. Holloman & Co.....	Clarksdale, Miss.
Cocke's Prolific.....	J. F. Hunter.....	Arcola, N. C.
Coker's Williamson.....	Pedigreed Seed Farm.....	Hartsville, S. C.
Columbia Beauty.....	T. W. Wood & Sons.....	Richmond, Va.
Currituck.....	W. A. Bolinger.....	Statesville, N. C., R. 6.
Deaton's Two-Ear.....	Charles Deaton.....	Carthage, N. C.
Experiment Station Yellow, No. 944.....	Alabama Experiment Station.....	Auburn, Ala.
Eureka.....	T. W. Wood & Sons.....	Richmond, Va.
First Generation Cross, No. 182.....	Bureau of Plant Industry.....	Washington, D. C.
Garrie.....	Pedigreed Seed Farm.....	Hartsville, S. C.
Gerrick's Prolific.....	Bureau of Plant Industry.....	Washington, D. C.
Goodman's Prolific.....	J. K. Goodman.....	Mount Ulla, N. C.
Gray Brown.....	Ben Shelton.....	Speed, N. C.
Hastings' Prolific.....	H. G. Hastings Co.....	Atlanta, Ga.
Henry Grady, No. 1015.....	Alabama Experiment Station.....	Auburn, Ala.
Horse Tooth.....	R. W. Howell.....	Terra Ceia, N. C.
Hunt's Prolific.....	Julian Stephenson.....	Wake Forest, N. C.
Jarvis' Golden Prolific.....	J. M. Jarvis.....	Winston-Salem, N. C.
Kerr's Prolific.....	James P. Kerr.....	Haw River, N. C.
Killibrew.....	W. M. Killibrew.....	Penelo, N. C.
Latham's Double.....	F. P. Latham.....	Belhaven, N. C.
Lewis.....	J. W. Lewis.....	Ferguson, N. C.
Lippard's Improved.....	J. H. Holcomb.....	Hominy, N. C.
Marlboro Prolific.....	Excelsior Seed Farm.....	Cheraw, S. C.
Marlboro Prolific.....	Pedigreed Seed Farm.....	Hartsville, S. C.
McNealy.....	L. R. McNealy.....	Bulls Gap, Tenn.
Parker's Prolific.....	T. B. Parker.....	Raleigh, N. C.
Patton.....	F. McL. Patton.....	Swannanoa, N. C.
Patton.....	R. L. Patton.....	Swannanoa, N. C.
Radcliff.....	Charles Radcliff.....	Pantego, N. C., R. F. D.
Richardson.....	G. T. Richardson.....	New Bern, N. C., R. F. D.
Schoolfield.....	R. L. Schoolfield.....	Greensboro, N. C., R. 4.
Southern Beauty.....	L. A. Strupe.....	Tobaccoville, N. C.
Southern Snowflake.....	T. W. Wood & Sons.....	Richmond, Va.
Tom Green.....	Thomas Green.....	Pantego, N. C.
Wannamaker.....	Model Seed Farm.....	St. Matthews, N. C.
Weekley's Improved.....	Iredell Test Farm.....	Statesville, N. C.
Weller.....	H. B. Moore.....	Battleboro, N. C.
White Crystalian.....	Holmes Arendell.....	Raleigh, N. C.
Wright's Prolific.....	W. I. Wright.....	Ingold, N. C.
Wyatt's Improved Yellow.....	W. L. Wyatt.....	Raleigh, N. C.

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FERTILIZER ANALYSES

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ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917. MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	
	Brands claiming								
106	American Agricultural Chemical Co., New York, N. Y.	Grain and Grass Compound	Elkin	8.00	.87	.66	1.65	2.00	\$24.93
114	American Fertilizing Co., Norfolk, Va.	Bone and Peruvian Guano	Asheboro	9.34	.51	.72	1.23	1.50	26.71
68	Armour Fertilizer Works, Greensboro, N. C.	Armour's Slaughter House for Grain Fertilizer.	Lenoir	9.39	.23	.64	.87	1.06	22.14
138	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Double Plant Food	Tabor	8.05	.91	.84	1.75	2.13	26.35
81	do	Baugh's Wheat Fertilizer for Wheat and Grass.	Greenville	8.14	1.11	.86	1.97	2.40	29.08
137	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 8-2-2 Standard Grade Guano	Statesville	7.72	.93	.82	1.75	2.13	25.32
171	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano	Rutherfordton	8.49	.99	.60	1.59	1.93	25.37
62	Co-operative Warehouse Co., Salisbury, N. C.	Farmer's Union 8-2-2 Guano	Lincolnton	7.84	.63	.92	1.55	1.88	25.40
65	Co-operative Warehouse Co., Wilmington, N. C.	do	Newton	7.34	.66	.76	1.42	1.73	21.60
199	Coweta Fertilizer Works, Newnan, Ga.	Coweta Success Guano	Mount Gilead	8.69	1.22	.48	1.70	2.07	27.78
131	Georgia Chemical Works, Augusta, Ga.	Georgia Formula	N. Wilkesboro	8.55	.59	.84	1.43	1.74	21.46
99	Imperial Co., Norfolk, Va.	Imperial Standard Premium Guano	Ruffin	8.22	1.21	.58	1.79	2.18	19.7
2061	Potapaseo Guano Co., Baltimore, Md.	Planter's Favorite	Walnut Cove	9.01	1.08	.60	1.68	2.04	24.67
209	Navassa Guano Co., Wilmington, N. C.	Navassa Cotton Fertilizer	Dunn	9.88	1.00	.54	1.54	1.87	25.81
2022	do	Navassa Ocenebree Tobacco Guano	Jamesville	8.40	1.14	.44	1.58	1.92	26.59
112	Old Buck Guano Co., Richmond, Va.	Old Buck Warsaw	Asheboro	8.39	1.03	.68	1.71	2.08	25.47
47	Old Dominion Guano Co., Richmond, Va.	Old Dominion Guano Co.'s Soluble Guano	Hiddenite	8.97	1.27	.58	1.85	2.25	25.44
178	Rasin Monumental Co., Baltimore, Md.	Rasin's Empire Guano	Landale	9.03	1.09	.54	1.63	1.98	24.48
129	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone Fertilizer for Tobacco, F. S. R.	Elkin	8.29	.89	.70	1.59	1.93	24.82
174	Swift & Co., Fertilizer Works, Atlanta, Ga.	Swift's Red Steer Standard Grade Guano	Cliffside	9.08	.71	.88	1.59	1.93	25.41
156	do	do	Bryson	9.15	.69	1.40	1.49	1.81	24.01

45	Tidewater Guano Co., Norfolk, Va.	Double Action Soluble Guano.	Taylorsville.	7.48	1.31	.30	1.61	1.96	1.82	23.34
91	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Standard for Grain.	Biltmore.	9.76	.23	.26	.49	.60	1.61	19.87
43	Union Guano Co., Winston, N. C.	Fish Brand Ammoniated Guano.	Taylorsville.	8.84	1.03	.58	1.61	1.94	2.21	26.65
57	Union Guano Co., Charlotte, N. C.	Old Honeydu Guano.	Cherryville.	8.74	1.17	.56	1.73	2.10	1.80	25.01
73	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand Guano.	Gibsonville.	7.79	1.25	.76	2.01	2.44	2.37	27.93
2001	do.	do.	Williamston.	8.89	.42	1.04	1.46	1.78	2.02	25.12
60	do.	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	Waco.	8.94	1.29	.46	1.75	2.13	2.08	26.69
88	do.	Eureka Ammoniated Bone.	Spruce Pine.	9.10	1.53	.36	1.89	2.30	2.79	30.99
222	do.	Norfolk & Carolina Chemical Co.'s Genuine Slaughter House Bone Guano C. S. M.	Washington.	8.10	.80	1.10	1.90	2.31	1.70	24.58
240	do.	Old Dominion Guano Co.'s Soluble Tobacco Guano.	Enfield.	9.32	1.48	.32	1.80	2.19	1.74	25.58
125	do.	Soluble Guano.	Ramseur.	7.90	1.61	.36	1.97	2.40	2.85	30.42
154	do.	S. W. Travers & Co., Beef, Blood & Bone Fertilizer.	Andrews.	8.86	1.51	.66	2.17	2.64	2.41	30.02
166	do.	V. C. C. Co.'s Farmer's Favorite Fertilizer C. S. M.	Wallace.	8.66	.41	1.40	1.81	2.20	1.94	25.96
2062	Brand claiming	Navassa Guano for Tobacco.	Walnut Cove.	8.00	1.52	.42	1.94	2.36	2.34	28.45
266	Brands claiming	Harris Complete Guano Meal Body	Wilson.	8.00	1.24	1.26	2.50	3.04	1.14	24.30
2010	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's 3-8-1 Fertilizer	Robersonville.	8.37	2.04	.46	2.50	3.04	1.08	24.27
269	Ober, G., & Sons Co., Baltimore, Md.	Ober's Golden Seal Tobacco Guano.	Fremont.	8.12	1.48	1.14	2.62	3.19	1.37	25.97
244	Richmond Guano Co., Richmond, Va.	Gilt Edge Tobacco Special	Spring Hope.	8.16	1.78	.68	2.46	2.99	1.19	24.44
219	Va.-Car. Chemical Co., Richmond, Va.	V. C. C. Co.'s Farmer's Friend High Grade Fertilizer Revised.	Washington.	7.20	1.26	1.18	2.44	2.97	1.15	23.20
205	Brands claiming	Lazaretto Special Tobacco and Potato Fertilizer.	Walstonburg.	8.00	1.64	.74	2.47	3.00	2.00	28.37
201	Baugh & Sons Co., Philadelphia, Pa.	Baugh's High Grade Tobacco Guano.	Goldsboro.	8.15	1.62	.82	2.44	2.97	2.32	30.00
2011	do.	do.	Robersonville.	8.00	1.74	.66	2.40	2.92	2.26	29.38
203	Contentnea Guano Co., Wilson, N. C.	Special Tobacco Grower.	Walstonburg.	7.74	.90	1.40	2.30	2.80	1.33	24.05
264	Craven Chemical Co., New Bern, N. C.	C. C. Co.'s Tobacco Special Revised.	Fremont.	8.27	1.36	.88	2.24	2.72	1.74	26.38
2041	Farmer's Fertilizer Works, Spartanburg, S. C.	Red Rooster Fertilizer.	Red Springs.	8.63	1.58	.80	2.38	2.89	1.93	28.28
268	Ober, G., & Sons Co., Baltimore, Md.	Spear Head Tobacco Guano.	Fremont.	8.22	1.68	1.16	2.84	3.45	2.19	29.84
246	Patapsco Guano Co., Baltimore, Md.	Patapsco High Grade Tobacco Special.	Rocky Mount.	8.07	1.70	.60	2.36	2.87	1.72	26.58
165	do.	V. C. C. Co.'s 3% C. S. M. Guano.	Wallace.	8.59	1.03	1.42	2.45	2.98	1.92	28.48

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917. MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
Brands claiming										
204	American Fertilizing Co., Norfolk, Va.	American Guano.	Wadesboro.	8.00			2.47	3.00	3.00	\$33.37
2026	Armour Fertilizer Works, Wilmington, N. C.	Armour's Tobacco Special Fertilizer.	Jamesville.	8.77	1.62	.78	2.40	2.92	3.31	35.40
157	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Three Score Complete Fertilizer.	Tabor.	8.14	1.20	1.34	2.54	3.09	3.03	33.96
2006	Old Buck Guano Co., Richmond, Va.	Old Buck Quincy Tobacco and Garden Meal Body.	Williamston.	8.75	1.57	.88	2.45	2.98	3.06	34.34
				7.92	1.40	1.20	2.60	3.16	3.18	34.74
2067	Pearsall & Co., Wilmington, N. C.	Pearsall's High Grade Guano.	Red Springs.	8.26	1.00	1.14	2.14	2.60	3.26	32.94
169	Va.-Car. Chemical Co., Richmond, Va.	Norfolk and Carolina Chemical Co.'s High Grade Manure.	Mount Olive.	8.74	.95	1.60	2.55	3.10	2.82	33.55
Brand claiming										
2030	Pearsall & Co., Wilmington, N. C.	Pearsall's High Grade Tobacco Guano.	Clarkton.	8.00			2.47	3.00	5.00	43.37
2033	Caraleigh Phosphate & Fertilizer Works, Raleigh, N. C.	Pearsall's High Grade Tobacco Guano.	Clarkton.	7.62	1.20	1.34	2.54	3.09	4.55	41.04
		Caraleigh 8-4-1.	Marietta.	8.00	2.04	1.10	3.29	4.00	1.00	26.82
Brand claiming										
228	Baugh & Sons Co., Norfolk, Va.	Baugh's Peruvian Guano Substitute.	Elizabeth City.	8.00			4.11	5.00	1.00	30.26
227	Baugh & Sons Co., Norfolk, Va.	Baugh's Tri Unit Potato Guano.	Elizabeth City.	8.00	3.18	.76	3.94	4.79	.96	30.49
		Pocomoke 7-8-1 Fertilizer.	Elizabeth City.	8.29	3.20	.70	4.11	5.00	3.00	40.26
237	Pocomoke Guano Co., Norfolk, Va.	Pocomoke 7-8-1 Fertilizer.	Elizabeth City.	8.00			5.76	7.00	1.00	37.19
172	Navassa Guano Co., Wilmington, N. C.	Pocomoke 7-8-1 Fertilizer.	Elizabeth City.	8.05	1.80	2.32	4.12	5.01	1.69	33.80
		Navassa Wheat Fertilizer.	Forest City.	9.00			.82	1.00	1.00	17.44
Brands claiming										
132	Georgia Chemical Works, Augusta, Ga.	Georgia Belle Compound.	N. Wilkesboro.	11.98	.13	.60	.73	.89	2.23	26.20
102	Rasin Monumental Co., Baltimore, Md.	Baltimore Special Mixture.	Milton.	9.00			.82	1.00	2.00	22.44
58	Royster, F. S., Guano Co., Norfolk, Va.	Beson Special Fertilizer.	Cherryville.	8.92	.45	.54	.99	1.20	1.64	21.28
			9.98	.59	.50	1.09	1.33	1.61	22.61	
				9.40	.43	.44	.87	1.06	1.90	22.55

44	Union Guano Co., Winston, N. C.	Carolina Grain Grower	Taylorsville	9.96	.53	.40	.93	1.13	1.97	23.72
20	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Little Giant Grain and Grass Grower.	Climax	9.16	.79	.24	1.03	1.25	1.94	23.19
Brands claiming										
110	Armour Fertilizer Works, Greensboro, N. C.	Armour's No. 9-2-1 for Grain Fertilizer	Asheboro	9.00			1.65	2.00	1.00	20.93
136	do.	Armour's No. 9-2-1 Fertilizer	Mount Holly	8.42	.67	1.04	1.71	2.08	1.50	23.10
6	Baugh & Sons Co., Norfolk, Va.	Baugh's Bone and Potash Mixture.	Burlington	9.19	.95	.64	1.59	1.93	.50	18.37
121	Lister's Agricultural Chemical Works, Newark, N. J.	Lister's Standard Super-phosphate.	Siler City	9.99	.61	.88	1.49	1.81	1.10	20.75
				9.16	1.25	.60	1.85	2.25	1.06	22.23
66	do.	do.	Newton	8.99	1.09	.50	1.59	1.93	.99	20.42
211	Navassa Guano Co., Wilmington, N. C.	Navassa Complete Fertilizer	Newton Grove	10.05	1.30	.38	1.03	2.04	1.05	22.36
111	Old Buck Guano Co., Richmond, Va.	Old Buck Clark's Wheat Formula	Asheboro	9.25	.85	.72	1.57	1.91	1.53	23.49
104	Reidsville Fertilizer Co., Reidsville, N. C.	Reidsville Big Crop Guano.	Mount Airy	8.82	1.21	.38	1.59	1.93	.85	19.75
181	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Honey Bee Special Compound	Catawba	9.52	1.01	.74	1.75	2.13	1.16	22.67
37	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Cotton Plant Standard Guano.	Hendersonville	9.49	.05	1.40	1.45	1.76	.94	20.28
59	Union Guano Co., Winston, N. C.	Q. & Q., Quality and Quantity Guano.	Waco	10.02	1.21	.60	1.81	2.20	.93	22.27
42	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Guano.	Clyde	10.73	.79	.68	1.47	1.79	.98	21.80
100	Venable Fertilizer Co., Richmond, Va.	Venable Bone Special.	Ruffin	9.05	.33	1.50	1.83	2.22	1.34	23.41
Brand claiming										
2028	Union Seed & Fertilizer Co., Wilmington, N. C.	U. S. & F. Co.'s Brand No. 3.	Marietta	9.00			2.26	2.75	.50	20.99
2024	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Tobacco and Cotton Grower	Williamston	9.49	1.38	1.18	2.56	3.11	1.76	29.04
2020	Columbia Guano Co., Norfolk, Va.	Columbia C. S. M. Special	Jamesville	9.08	.82	1.38	2.20	2.67	1.88	27.72
265	Harris Co-operative Co., Wilson, N. C.	Harris' Meal Mixture	Wilson	9.12	1.08	1.44	2.52	3.06	2.36	31.50
197	Navassa Guano Co., Wilmington, N. C.	Manipulated Guano.	Nashville	9.98	1.32	.90	2.22	2.70	2.12	29.90
245	Rasin-Monumental Co., Baltimore, Md.	Rasin's Dixie Tobacco Guano.	Nashville	8.40	.90	1.30	2.20	2.67	2.13	28.29
243	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Meal Mixture, F. S. R.	Rocky Mount	9.52	.74	1.42	2.16	2.63	1.98	28.49
241	Southern Cotton Oil Co., Rocky Mount, N. C.	Goldsboro Cotton Grower, C. S. M.	Rocky Mount	7.51	.58	1.68	2.26	2.75	2.14	27.70
2035	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Special Tobacco Manure.	Marietta	9.97	1.76	.54	2.30	2.80	1.95	29.38
238	do.	V. C. C. Co.'s Prolife Cotton Grower, C. S. M.	Rocky Mount	9.59	1.24	.96	2.20	2.67	2.06	29.13
196	do.	do.	Goldsboro	9.45	.70	1.52	2.22	2.70	1.90	28.27
239	do.	V. C. C. Co.'s Standard Cotton Grower.	Nashville	8.41	.88	1.32	2.20	2.67	2.23	28.80
2002	do.	V. C. C. Co.'s White Stem, C. S. M.	Williamston	8.77	.94	1.40	2.34	2.84	2.14	29.40
Brand claiming										
248	American Agricultural Chemical Co., New York, N. Y.	Vance Best Grade Tobacco Manure, Vance	Spring Hope	9.00			2.47	3.00	2.00	29.37
				9.20	1.50	1.08	2.58	3.14	2.63	33.19

2072	do.....	do.....	Hope Mills.....	6.07	2.28	.80	3.08	3.74	19.01
2075	Bowker Fertilizer Co., Boston, Mass.....	Bowker's 4-6-0.....	Hope Mills.....	6.69	2.18	.90	3.08	3.74	16.93
2082	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Caraleigh 6-4 Ammoniated Phosphate.....	Marietta.....	7.22	1.42	1.76	3.18	3.87	20.38
2085	Conestee Chemical Co., Wilmington, N. C.....	Conestee 6-4-0 Fertilizer.....	Marietta.....	6.10	1.78	1.11	2.92	3.55	18.36
207	Coe-Mortimer Co., Charleston, S. C.....	Coe-Mortimer Co.'s 6-4-0.....	Laurinburg.....	5.67	1.74	1.20	2.94	3.57	18.02
255	Imperial Co., Norfolk, Va.....	Imperial 4-6-0 Fertilizer.....	Parkton.....	7.03	2.56	.88	3.44	4.18	21.48
2013	do.....	do.....	Greenville.....	6.72	2.44	.56	3.00	3.65	19.32
Brand claiming	V. C. Co.'s 6-5-0 Ammoniated Superphosphate.....	V. C. Co.'s 6-5-0 Ammoniated Superphosphate.....	Elizabeth City.....	6.00		4.11	5.00		23.26
225	Va.-Car. Chemical Co., Richmond, Va.....		Elizabeth City.....	6.78	3.18	.74	3.92	4.77	23.24
Brands claiming	Robertson Fertilizer Co., Norfolk, Va.....	Robertson's 7-6 Guano.....	Bethel.....	6.00			5.76	7.00	30.19
2054	Swift & Co., Fertilizer Works, Atlanta, Ga.....	Swift's Trucking Compound High Grade 6-7-0.....	Elizabeth City.....	6.18	3.32	2.10	5.42	6.59	28.94
234				5.81	2.50	3.14	5.64	6.86	29.50
Brand claiming	Swift & Co. Fertilizer Works, Atlanta, Ga.....	Swift's Virginia Potato Grower, High Grade.....	Elizabeth City.....	7.00			4.11	5.00	24.26
2017				7.00	1.96	2.06	4.02	4.89	23.88
Brands claiming	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Caraleigh Special Ammoniated Phosphate.....	Red Springs.....	7.50			3.70	4.50	23.04
2044				8.96	1.06	2.54	3.60	4.38	24.08
2046	do.....	do.....	Red Springs.....	8.86	.92	2.48	3.40	4.13	23.14
16	Va.-Car. Chemical Co., Richmond, Va.....	Mammoth Ammoniated Compound.....	Waynesville.....	8.00			1.65	2.00	14.93
232	Swift & Co., Fertilizer Works, Atlanta, Ga.....	Swift's Special A, Low Grade 8-3-0.....	Elizabeth City.....	10.75	1.29	.54	1.83	2.22	18.44
Brands claiming	Aene Mfg. Co., Wilmington, N. C.....	Aene 8-4-0 Special Fertilizer.....	Mount Olive.....	8.00			2.47	3.00	18.37
168	do.....	do.....	Goldsboro.....	9.12	.86	1.40	2.26	2.75	18.61
202	American Fertilizing Co., Norfolk, Va.....	American 8-4 Ammoniated Compound.....	Dunn.....	8.00			3.29	4.00	21.82
183	Coe-Mortimer Co., Charleston, S. C.....	Coe-Mortimer Co.'s 8-4-0 Fertilizer.....	Maxton.....	8.12	1.91	1.94	3.85	4.68	24.39
259	McNair Phosphate Co., Laurinburg, N. C.....	McNair Phosphate Co.'s 8-4-0 Fertilizer.....	Cove City.....	8.09	1.22	1.48	2.70	3.28	19.43
206	Meadows, E. H. & J. A. Co., New Bern, N. C.....	Meadows' Ideal Special Tobacco.....	Newton Grove.....	8.10	2.27	.86	3.13	3.81	21.25
2047	Navassa Guano Co., Wilmington, N. C.....	Navassa H. G. Ammoniated Superphosphate.....	Red Springs.....	7.90	2.02	1.04	3.06	3.72	20.75
210			Hope Mills.....	8.47	1.96	1.08	3.04	3.70	21.24
2068	Pearsall & Co., Wilmington, N. C.....	Pearsall's Bone Meal and Fish Guano.....		7.30	1.18	1.56	2.74	3.33	18.81
2076	Pocomoke Guano Co., Norfolk, Va.....	Pocomoke 4-8-0 Fertilizer.....		9.46	2.28	.44	2.72	3.31	20.88

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory	
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash		Total
Brands claiming											
2003	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Defender, Ammoniated	Robersonville.	8.00	2.38	.98	3.29	4.00	---	\$21.82	22.20
242	Southern Cotton Oil Co., Rocky Mount, N. C.	Sooco Ammoniated Compound.	Enfield.	7.94	1.56	1.40	2.96	3.60	---	20.37	23.00
160	do.	V.-C. 8-4-0 Ammoniated Compound.	Tabor.	9.19	3.11	.20	3.31	4.02	---	25.26	23.86
Brands claiming											
226	Eastern Cotton Oil Co., Hertford, N. C.	Our Surprise.	Elizabeth City.	8.00	1.16	2.58	3.74	4.55	---	23.90	23.86
254	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's 8-5-0 Fish Scrap Guano.	Fayetteville.	8.15	1.96	1.78	3.74	4.55	---	23.95	24.24
215	Pamlico Chemical Co., Washington, N. C.	Pamlico Tip-Top Potato Guano.	Edenton.	7.92	2.76	1.06	3.82	4.64	---	24.24	24.58
233	Swift & Co., Fertilizer Works, Atlanta, Ga.	Swift's Special Truck Fertilizer High Grade 8-5-0.	Elizabeth City.	7.94	1.70	2.18	3.88	4.72	---	24.58	32.19
223	Va.-Car. Chemical Co., Richmond, Va.	V.-C. 8-5-0 Ammoniated Superphosphate.	Washington.	7.70	3.34	.68	4.02	4.89	---	32.11	19.37
Brand claiming											
229	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's for All Crops, 8-7 Ammoniated Phosphate.	Elizabeth City.	8.00	---	---	5.76	7.00	---	19.30	18.15
Brands claiming											
208	Acme Manufacturing Co., Wilmington, N. C.	Acme 9-3-0 Special Fertilizer.	Maxton.	9.00	---	---	2.47	3.00	---	19.37	19.30
30	Armour Fertilizer Works, Greensboro, N. C.	Armour's Ammoniated Superphosphate Fertilizer.	Norwood.	8.72	1.14	1.38	2.52	3.06	---	18.15	19.71
161	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Non-potash Mixture.	Chadbourn.	8.70	1.25	1.00	2.25	2.74	---	19.71	19.78
260	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co.'s Fish Mixture.	Parkton.	9.42	1.45	1.00	2.45	2.98	---	19.78	19.92
2043	Farmer's Fertilizer Works, Spartanburg, S. C.	Red Rooster Fertilizer.	Red Springs.	9.52	1.80	.64	2.44	2.97	---	24.59	20.53
75	Georgia Chemical Works, Augusta, Ga.	Georgia Special Superphosphate.	Gibsonville.	11.49	2.99	.28	2.57	3.12	---	19.71	20.06
283	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's 9-3-0 Fish Scrap Guano.	Fayetteville.	8.69	1.28	1.54	2.82	3.43	---	19.71	20.06
2008	New Bern Cotton Oil and Fertilizer Works, New Bern, N. C.	Onslow Crop Grower.	Robersonville.	8.87	.76	1.82	2.58	3.14	---	20.06	20.06
2019	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Simplex Ammoniated	Jamesville.	8.89	1.92	.74	2.66	3.23	---	20.06	20.06

231	Swift & Co., Fertilizer Works, Atlanta, Ga.-----	Swift's Sweet Potato Fertilizer, Low Grade 9-3-0.-----	Elizabeth City.-----	9.95	.72	1.58	2.30	2.80	-----	19.61
2029	Union Seed and Fertilizer Co., Wilmington, N. C.-----	U. S. & F. Co.'s Brand No. 10.-----	Marietta.-----	8.99	1.34	.78	2.12	2.58	-----	17.89
2027	Va.-Car. Chemical Co., Richmond, Va.-----	V.-C. C. Co.'s Cotton Ammoniated Compound.-----	Marietta.-----	10.65	1.90	.44	2.34	2.84	-----	20.48
2058	-----do.-----	do.-----	Windsor.-----	9.71	1.72	.50	2.22	2.71	-----	19.03
2077	Brands claiming.-----	V.-C. 9-3-0 Ammoniated Superphosphate.-----	-----	9.00	-----	-----	2.47	3.00	-----	19.37
159	Va.-Car. Chemical Co., Richmond, Va.-----	V.-C. C. Co.'s Cotton Ammoniated Compound.-----	Hope Mills.-----	9.93	1.82	.72	2.54	3.09	-----	20.60
-----do.-----	-----	-----	Tabor.-----	9.92	1.53	.76	2.29	2.73	-----	19.54
163	Brand claiming	V.-C. C. Co.'s Bone and Fish Ammoniated Compound.-----	Chadbourn.-----	8.00	-----	-----	3.29	4.00	-----	22.82
-----	Va.-Car. Chemical Co., Richmond, Va.-----	-----	-----	7.75	2.07	1.02	3.09	3.76	-----	20.73
170	Brands claiming.-----	Armour's Grain Special Fertilizer.-----	Shelby.-----	10.00	-----	-----	1.65	2.00	-----	16.93
56	Berkley Fertilizer Works, Greensboro, N. C.-----	Berkley 2-1-0 Fertilizer.-----	Monroe.-----	10.69	.55	1.14	1.69	2.05	-----	17.79
145	Georgia Chemical Co., Norfolk, Va.-----	Georgia Special 10-2-0 Superphosphate.-----	Lexington.-----	10.15	.99	.56	1.55	1.88	-----	16.66
28	Norfolk Fertilizer Co., Norfolk, Va.-----	Oriana 2-1-0 Fertilizer.-----	Mount Gilead.-----	10.40	.93	.42	1.35	1.64	-----	16.07
118	Old Buck Guano Co., Richmond, Va.-----	Old Buck Ammoniated Phosphate.-----	Sher City.-----	10.92	.91	.50	1.41	1.71	-----	16.84
179	Povhatan Chemical Co., Richmond, Va.-----	Magio Guano.-----	Landale.-----	10.69	.79	.72	1.51	1.84	-----	17.03
87	Royster, F. S., Guano Co., Norfolk, Va.-----	Columbia Duplex Ammoniated Phosphate.-----	Burnsville.-----	9.00	.11	1.66	1.77	2.15	-----	16.43
-----	Union Guano Co., Norfolk, Va.-----	Union 10-2 Superphosphate.-----	Brown Summit.-----	11.36	.95	.38	1.33	1.62	-----	16.95
94	Va.-Car. Chemical Co., Richmond, Va.-----	Va.-Car. Chemical Co.'s Ammoniated Compound.-----	Greensboro.-----	10.63	.91	.32	1.23	1.50	-----	15.80
23	Brand claiming.-----	Acme 10-3 Fertilizer.-----	-----	10.00	-----	-----	2.47	3.00	-----	20.37
2073	Acme Mfg. Co., Wilmington, N. C.-----	Royster's Landmark Ammoniated Phosphate.-----	Biscoe.-----	11.51	.87	1.28	2.15	2.61	-----	20.54
-----	Royster, F. S., Guano Co., Norfolk, Va.-----	-----	St. Paul.-----	10.52	2.14	1.12	3.26	3.96	-----	24.21
176	Brands claiming	Navassa Guano Co., Wilmington, N. C.-----	Lawndale.-----	11.00	-----	-----	.82	1.00	-----	14.44
177	Union Guano Co., Winston-Salem, N. C.-----	Union Special 11-1 Superphosphate.-----	Lawndale.-----	13.29	.53	.32	.85	1.03	-----	16.86
5	Brands claiming.-----	Baugh's Old Standby Dissolved Animal Bone.-----	Burlington.-----	12.00	-----	-----	1.65	2.00	-----	18.93
2034	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.-----	Caraleigh 12-2 Ammoniated Phosphate.-----	Marietta.-----	12.15	1.07	.56	1.63	1.98	-----	19.00
-----	-----	-----	-----	12.85	1.02	.70	1.72	2.09	-----	20.08

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash Total	
96	Brands claiming. Ober, G., & Sons Co., Baltimore, Md.	Clinax Standard Ammoniated Compound.	Reidsville.	12.00	—	—	1.85	2.00	3.00	\$18.93
61	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Ammoniated Phosphate.	Crouse.	10.27	.53	1.64	2.17	2.64	—	19.38
120	Union Guano Co., Winston, N. C.	Union Special 12-2-0 Superphosphate.	Siler City.	12.45	1.41	.22	1.63	1.98	—	19.30
1	Brands claiming. Union Guano Co., Norfolk, Va.	9-3 Bone and Potash.	Greensboro.	8.34	—	—	—	—	3.00	24.00
		—do—	Greensboro.	9.38	—	—	—	—	3.10	23.84
77	Brands claiming. American Agricultural Chemical Co., New York, N. Y.	Alkaline Phosphate.	Ramseur.	10.00	—	—	—	—	2.00	20.00
124	American Fertilizing Co., Norfolk, Va.	Dissolved Bone and Potash for Corn and Wheat.	Ilildebran.	10.56	—	—	—	—	1.85	18.81
108	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 10-0-2 Bone and Potash Standard Grade.	Elkin.	10.02	—	—	—	—	1.66	18.32
142	Swift & Co., Fertilizer Works, Atlanta, Ga.	Swift's Wheat Grower's Standard Grade Phos-Potash.	Mooresville.	10.24	—	—	—	—	1.69	18.69
90	—do—	—do—	Clyde.	10.15	—	—	—	—	1.58	18.05
49	Union Guano Co., Charlotte, N. C.	Birmingham Special Bone and Potash.	Mooresville.	10.42	—	—	—	—	1.36	17.22
25	Union Guano Co., Winston-Salem, N. C.	Union Bone and Potash.	Troy.	10.49	—	—	—	—	1.98	20.39
7	Imperial Co., Norfolk, Va.	Imperial 12-2 Potash Mixture.	Burlington.	10.04	—	—	—	—	2.14	20.74
17	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co., Blue Ridge Wheat Grower.	Waynesville.	9.52	—	—	—	—	1.58	17.42

40	do	Southern Chemical Co., Mammoth Wheat Grower.	Clyde	9.45	1.31	16.00
72	do	Travers & Co., Capitol Fertilizer	Durham	10.74	1.85	19.99
189	Brands claiming Armour Fertilizer Works, Greensboro, N. C.	Armour's Acid and Potash	Fayetteville	10.00	3.00	25.00
191	do	do	Fayetteville	10.70	2.92	25.30
				10.24	2.89	24.69
	Brand claiming			10.00	1.00	16.00
11	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s 11-1 Bone and Potash	Burlington	13.97	.52	16.57
				12.00	2.00	22.00
119	Brand claiming Co-operative Warehouse Co., Salisbury, N. C.	Farmer's Union 12-0-2 Bone and Potash High Grade.	Siler City	12.13	1.95	21.83
	Brand claiming			14.00	2.00	24.00
31	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 14-0-2 Bone and Potash, High Grade.	Albemarle	14.87	1.88	24.27

RAW OR UNMIXED FERTILIZER MATERIALS.

92	Brand claiming Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Double Bone Phosphate, Extra Strong.	Hillsboro	13.00		\$11.70
				15.66		14.09
139	Brands claiming American Fertilizing Co., Norfolk, Va.	High Grade Acid Phosphate	Hildebran	14.00		12.60
69	Armour Fertilizer Works, Greensboro, N. C.	Armour's Star Phosphate.	Lenoir	15.38		13.84
95	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s 14% Acid Phosphate	Greensboro	12.31		11.03
				15.23		13.71
24	Brands claiming Acme Manufacturing Co., Wilmington, N. C.	16% Acid Phosphate	Biscoe	16.00		14.40
182	do	do	Fayetteville	17.87		16.06
123	American Agricultural Chemical Co., New York, N. Y.	Superphosphate	Stanley	16.93		15.24
				16.29		14.66
185	American Fertilizing Co., Norfolk, Va.	American High Grade Acid Phosphate	Dunn	17.42		15.68
36	Armour Fertilizer Works, Greensboro, N. C.	Armour's 16% Acid Phosphate	Hendersonville	16.88		15.19
187	do	do	Fayetteville	16.85		15.16
188	do	do	Fayetteville	16.64		14.98
193	do	do	Fayetteville	16.63		14.97
190	do	do	Fayetteville	16.51		14.86
39	Asheville Packing Co., Asheville, N. C.	Asheville Packing Co.'s High Grade Phosphate.	Asheville	16.37		14.73

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917 MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory	
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		Total Potash
Brands claiming										
113	Atlantic Chemical Co., Norfolk, Va.	High Grade Dissolved Bone and Potash, 16%.	Asheville.	16.00	-----	-----	-----	-----	\$14.40	
			Asheboro.	17.42	-----	-----	-----	-----	15.08	
144	Atlantic Fertilizer Works, Wilmington, N. C.	Atlantic Acid Phosphate, 16% High Grade	Lexington.	16.32	-----	-----	-----	-----	14.69	
83	Baugh & Sons Co., Philadelphia, Pa.	Baugh's 16% Acid Phosphate.	Greensboro.	17.86	-----	-----	-----	-----	16.07	
55	Berkley Chemical Co., Norfolk, Va.	Resolute Acid Phosphate.	Monroe.	17.05	-----	-----	-----	-----	15.34	
138	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 16% Acid Phosphate.	Statesville.	16.71	-----	-----	-----	-----	15.04	
122	do.	do.	Stanley.	17.26	-----	-----	-----	-----	15.53	
127	Carolina Union Fertilizer Co., Norfolk, Va.	Carolina Union 16%.	Elkin.	16.94	-----	-----	-----	-----	15.25	
93	do.	do.	Hillsboro.	16.60	-----	-----	-----	-----	14.94	
151	Chickamauga Fertilizer Works, Chattanooga, Tenn.	Chickamauga High Grade No. 16, Dissolved Bone.	Murphy.	16.53	-----	-----	-----	-----	14.88	
150	Columbia Guano Co., Norfolk, Va.	Columbia High Grade 16% Acid Phosphate.	Kings Mountain.	16.68	-----	-----	-----	-----	15.01	
186	Conestee Chemical Co., Wilmington, N. C.	16% Acid Phosphate.	Fayetteville.	16.73	-----	-----	-----	-----	15.06	
64	Co-operative Warehouse Co., Salisbury, N. C.	Farmier's Union 16% Acid Phosphate.	Gastonia.	16.40	-----	-----	-----	-----	14.76	
200	Coveta Fertilizer Co., Newman, Ga.	Coveta 16% Acid Phosphate.	Mount Gilead.	16.44	-----	-----	-----	-----	14.80	
14	Farmer's Fertilizer Works, Spartanburg, S. C.	Red Rooster Acid Phosphate.	Dillsboro.	15.96	-----	-----	-----	-----	14.36	
26	Farmer's Guano Co., Raleigh, N. C.	F. G. Co., 16% Acid Phosphate.	Mount Gilead.	17.40	-----	-----	-----	-----	15.66	
76	Georgia Chemical Works, Augusta, Ga.	High Grade Dissolved Bone Phosphate.	Gibsonville.	17.27	-----	-----	-----	-----	15.54	
198	do.	do.	Wadesboro.	17.47	-----	-----	-----	-----	15.72	
8	Imperial Co., Norfolk, Va.	Imperial High Grade Tennessee Acid Phosphate.	Burlington.	16.01	-----	-----	-----	-----	14.41	
4	Navassa Guano Co., Wilmington, N. C.	Navassa 16% Acid Phosphate.	Graham.	17.46	-----	-----	-----	-----	15.71	
173	do.	do.	Forest City.	17.41	-----	-----	-----	-----	15.67	
27	Norfolk Fertilizer Co., Norfolk, Va.	Oriana 16% Acid Phosphate.	Mount Gilead.	17.39	-----	-----	-----	-----	15.65	

29	Old Buck Guano Co., Richmond, Va.....	Old Buck 16% Acid Phosphate.....	Norwood.....	16.47	14.82
251	Palmetto Guano Corporation, Columbia, S. C.....	Palmetto Acid Phosphate.....	Parkton.....	16.30	14.67
252	do.....	do.....	Parkton.....	15.92	14.33
148	Pamlico Chemical Co., Washington, N. C.....	Pamlico High Grade Acid Phosphate.....	Salisbury.....	16.98	15.28
67	Palapasco Guano Co., Baltimore, Md.....	Florida Soluble Phosphate.....	Hickory.....	16.53	14.88
2031	Pearsall & Co., Wilmington, N. C.....	Pearsall's High Grade 16% Acid Phosphate.....	Clarkton.....	16.57	14.91
2038	do.....	do.....	Marietta.....	16.32	14.69
2070	do.....	do.....	Linden.....	16.50	14.85
184	do.....	do.....	Fonville.....	14.81	13.33
54	Planter's Fertilizer and Phosphate Co., Charleston, S. C.....	Planter's 16% Acid Phosphate.....	Wadesboro.....	17.27	15.54
180	Powhatan Chemical Co., Richmond, Va.....	Magic Dissolved Bone.....	Landale.....	16.83	15.15
63	Rasin-Monumental Co., Baltimore, Md.....	Rasin's 16% Acid Phosphate.....	Lincolnton.....	16.71	15.01
141	do.....	do.....	Lincolnton.....	17.50	15.75
152	Read Phosphate Co., Nashville, Tenn.....	Read's Special High Grade Acid Phosphate.....	Murphy.....	15.98	14.38
135	Robertson Guano Co., Richmond, Va.....	Rex Dissolved Bone.....	Concord.....	17.04	15.34
133	Robertson Fertilizer Co., Norfolk, Va.....	Iligh Peak Acid Phosphate.....	N. Wilkesboro.....	16.10	14.49
85	Royster, F. S., Guano Co., Norfolk, Va.....	Columbia High Grade 16% Acid Phosphate.....	Toecane.....	16.85	15.16
207	do.....	do.....	Jamesville.....	16.02	14.42
32	do.....	Royster's High Grade 16% Acid Phosphate.....	Waynesville.....	16.76	15.08
48	Swift & Co., Fertilizer Works, Atlanta, Ga.....	Swift's Special High Grade Acid Phosphate.....	Stony Point.....	15.93	14.34
153	do.....	do.....	Murphy.....	18.04	16.24
147	Tennessee Chemical Co., Greensboro, N. C.....	Ox Tennessee High Grade Acid Phosphate.....	Thomasville.....	16.68	14.99
146	Tidewater Guano Co., Norfolk, Va.....	Top Rail Acid Phosphate.....	Lexington.....	16.49	14.84
51	Tuscarora Fertilizer Co., Greensboro, N. C.....	Tuscarora Acid Phosphate.....	Mocksville.....	16.24	14.62
126	Union Guano Co., Norfolk, Va.....	Union 16% Acid Phosphate.....	Elkin.....	16.77	15.09
70	Union Guano Co., Winston, N. C.....	do.....	Lenoir.....	17.30	15.57
18	Va-Car. Chemical Co., Richmond, Va.....	Atlantic-Virginia Fertilizer Co.'s Eureka.....	Asheville.....	16.31	14.68
155	do.....	Davie & Whittle's Owl Brand High Grade.....	Andrews.....	16.55	14.89
71	do.....	Southern Chemical Co.'s Comet, 16% Acid Phosphate.....	Lenoir.....	17.56	15.89
117	do.....	do.....	Pittsboro.....	16.84	15.16
41	do.....	Travers & Co., Champion Acid Phosphate.....	Clyde.....	16.43	14.79
12	do.....	V.-C. Co.'s 16% Acid Phosphate.....	Franklin.....	17.17	15.45

THE BULLETIN
OF THE
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DEPARTMENT OF AGRICULTURE
RALEIGH

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REGISTRATION BRANDS OF FERTILIZER
TO FEBRUARY 15, 1917

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*Assigned by the Bureau of Soils, United States Department of Agriculture.

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‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

LETTER OF TRANSMITTAL

RALEIGH, N. C., March 1, 1917.

To HON. W. A. GRAHAM,
Commissioner of Agriculture,
Raleigh.

DEAR SIR:—I submit herewith list of brands of fertilizers which have been registered, together with figures showing guaranteed analysis. I recommend that these be published as supplemental to the March, 1917. BULLETIN.

K. W. BARNES,
Secretary.

Approved for printing:
W. A. GRAHAM,
Commissioner.

ACME MANUFACTURING CO.,
WILMINGTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Acme 4-10-0 Top Dresser	4.00	8.25	....
Acme 3-9-0 Top Dresser	3.00	7.40	....
Acme 12-4-0 Fertilizer	12.00	3.30	....
Acme 12-4-0 Special Fertilizer	12.00	3.30	....
Acme 12-3-0 Fertilizer	12.00	2.47	....
Acme 12-3-0 Special Fertilizer	12.00	2.47	....
Acme 12-2-0 Fertilizer	12.00	1.65	....
Acme 12-2-0 Special Fertilizer	12.00	1.65	....
Acme 10-4-0 Fertilizer	10.00	3.30	....
Acme 10-4-0 Special Fertilizer	10.00	3.30	....
Acme 10-3-0 Fertilizer	10.00	2.47	....
Acme 10-3-0 Special Fertilizer	10.00	2.47	....
Acme 10-2-0 Fertilizer	10.00	1.65	....
Acme 10-2-0 Special Fertilizer	10.00	1.65	....
Acme 9-4-0 Fertilizer	9.00	3.30	....
Acme 9-4-0 Special Fertilizer	9.00	3.30	....
Acme 9-3-0 Fertilizer	9.00	2.47	....
Acme 9-3-0 Special Fertilizer	9.00	2.47	....
Acme 8-4-0 Fertilizer	8.00	3.30	....
Acme 8-4-0 Special Fertilizer	8.00	3.30	....
Acme 7-5-0 Fertilizer	7.00	4.12	....
Acme 7-5-0 Special Fertilizer	7.00	4.12	....
Acme 6-5-0 Fertilizer	6.00	4.12	....
Acme 6-5-0 Special Fertilizer	6.00	4.12	....
Acme 6-4-0 Fertilizer	6.00	3.30	....
Acme 6-4-0 Special Fertilizer	6.00	3.30	....
16 per cent Acid Phosphate.....	16.00	....	....
Sulphate of Ammonia.....	....	20.56	....
Nitrate of Soda.....	....	14.81	....
Fish Scrap	4.00	8.22	....
Dried Ground Blood.....	....	11.51	....
Cotton Seed Meal.....	....	6.17	....

A. D. ADAIR & McCARTY BROS., INC.,
ATLANTA, GA., AND CHATTANOOGA, TENN.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Adair's Soluble Pacific Guano.....	10.00	1.65	2.00
Adair's Ammoniated Dissolved Bone.....	8.00	1.65	2.00
Adair's Blood-Meal Compound	10.00	1.65	1.00
Adair's Blood-Meal Compound No. 921.....	9.00	1.65	1.00
Adair's Blood, Bone and Tankage Guano.....	9.00	.82	2.00
McCarty's Soluble Bone.....	10.00	.82	1.00
Adair's Wheat and Corn Grower.....	10.00	....	4.00
Adair's High Grade Potash Compound.....	10.00	....	4.00
Adair's Formula	10.00	....	2.00
A. and M. Special Fertilizer No. 1220.....	12.00	1.65	....
A. and M. Special Fertilizer No. 1020.....	10.00	1.65	....
Adair's H. G. Dissolved Bone No. 16.....	16.00	....	....
Adair's H. G. Dissolved Bone.....	14.00	....	....
Adair's Dissolved Bone	12.00	....	....
Nitrate of Soda.....	....	15.00	....

THE AMERICAN AGRICULTURAL CHEMICAL CO.,
DIXIE GUANO COMPANY, SPARTANBURG, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Dixie Acid Phosphate	14.00	....	....
Dixie Acid Phosphate	16.00	....	....
Dixie Ammoniated Fertilizer	11.00	.82	....
Dixie Ammoniated Fertilizer AA.....	10.00	1.65	....
Dixie Ammoniated Fertilizer AAA.....	10.00	2.47	....
Dixie Ammoniated Fertilizer	8.00	3.29	....
Dixie Ammoniated Fertilizer AAAA.....	10.00	3.29	....
Dixie Fertilizer	10.00	.82	1.00
Dixie Fertilizer	9.00	1.65	1.00
Dixie Fertilizer	8.00	2.47	1.00
Dixie Special Fertilizer	5.00	5.76	1.00

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY,
FARMERS' FERTILIZER WORKS, SPARTANBURG, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Red Rooster Acid Phosphate	14.00	....	....
Red Rooster Acid Phosphate	16.00	....	....
Red Rooster Ammoniated Fertilizer	11.00	.82	....
Red Rooster Ammoniated Fertilizer AA.....	10.00	1.65	....
Red Rooster Ammoniated Fertilizer AAA.....	10.00	2.47	....
Red Rooster Ammoniated Fertilizer	8.00	3.29	....
Red Rooster Ammoniated Fertilizer AAAA.....	10.00	3.29	....
Red Rooster Fertilizer	10.00	.82	1.00
Red Rooster Fertilizer	9.00	1.65	1.00
Red Rooster Fertilizer	8.00	2.47	1.00
Red Rooster Special Fertilizer.....	5.00	5.76	1.00
Red Rooster Fertilizer	8.00	1.65	2.00
Red Rooster Fertilizer	9.00	1.65	2.00
Red Rooster Fertilizer	10.00	1.65	2.00
Red Rooster Fertilizer	8.00	2.47	2.00

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY,
HENDERSON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Planters Special "8-3-2".....	8.00	2.47	2.00
Planters Special "8-3-3".....	8.00	2.47	3.00
Planters Special "9-3-2".....	9.00	2.47	2.00
Planters Special "9-3-1".....	8.00	2.47	1.00
Planters Special "8-2-2".....	8.00	1.65	2.90
Planters Special "9-2-1".....	9.00	1.65	1.00
Planters Special "9-3-0".....	9.00	2.47	....
Planters Special "8-4-0".....	8.00	3.29	....
Planters Special "5-10" Top Dresser.....	5.00	8.23	....
Coopers Brand "8-3-2".....	8.00	2.47	2.00
Coopers Brand "8-3-3".....	8.00	2.47	3.00
Coopers Brand "9-3-2".....	9.00	2.47	2.00
Coopers Brand "8-3-1".....	8.00	2.47	1.00
Coopers Brand "8-2-2".....	8.00	1.65	2.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Coopers Brand "9-2-1".....	9.00	1.65	1.00
Coopers Brand "9-3-0".....	9.00	2.47	....
Coopers Brand "8-4-0".....	8.00	3.29	....
Coopers Brand "5-10" Top Dresser.....	5.00	8.23	....
Roses Brand "8-3-2".....	8.00	2.47	2.00
Roses Brand "8-3-3".....	8.00	2.47	3.00
Roses Brand "9-3-2".....	9.00	2.47	2.00
Roses Brand "8-3-1".....	8.00	2.47	1.00
Roses Brand "8-2-2".....	8.00	1.65	2.00
Roses Brand "9-2-1".....	9.00	1.65	1.00
Roses Brand "9-3-0".....	9.00	2.47	....
Roses Brand "8-4-0".....	8.00	3.29	....
Roses Brand "5-10" Top Dresser.....	5.00	8.23	....
Farmers Union.....	9.00	2.47	3.00
Fish Brand Tobacco Manure.....	8.00	2.47	3.00
High Grade Tobacco Manure.....	8.00	2.47	2.00
Vance Best Grade Tobacco Manure.....	9.00	2.47	2.00
Standard Fertilizer.....	8.00	2.47	1.00
Hot Stuff for Tobacco.....	8.00	1.65	2.00
Farmers Special Fertilizer.....	9.00	1.65	1.00
No. 1 Ammoniated Fertilizer.....	9.00	2.47	....
No. 2 Ammoniated Fertilizer.....	8.00	3.29	....
Acid Phosphate.....	16.00	....	....
Vance Special Top Dresser.....	5.00	8.23	....
Ellis Brand "8-3-2".....	8.00	2.47	2.00
Ellis Brand "8-3-3".....	8.00	2.47	3.00
Ellis Brand "9-3-2".....	9.00	2.47	2.00
Ellis Brand "8-3-1".....	8.00	2.47	1.00
Ellis Brand "8-2-2".....	8.00	1.65	2.00
Ellis Brand "9-2-1".....	9.00	1.65	1.00
Ellis Brand "9-3-0".....	9.00	2.47	....
Ellis Brand "8-4-0".....	8.00	3.29	....
Ellis Brand "5-10" Top Dresser.....	5.00	8.23	....

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY,

BALTIMORE SALES DEPT.,

BALTIMORE AND NEW YORK.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Bradley's B. D. Sea Fowl Guano.....	8.00	2.39	2.00
Canton Chemical Fish Mixture.....	9.00	1.65	1.00
Detrick's 16 per cent Acid Phosphate.....	16.00	....	....
Canton Chemical H. G. Ammo. Superphosphate with Potash..	8.00	2.47	1.00
Detrick's Rival Tobacco Compound.....	8.00	1.65	2.00
Detrick's K. K. K. Bright Tobacco Grower, Revised.....	8.00	2.47	2.00
Detrick's "5-7-0 Fertilizer".....	7.00	4.11	....
Reese's Pacific Guano.....	8.00	1.65	2.00
Lazaretto 16 per cent Acid Phosphate.....	16.00	....	....
Lazaretto Crop Grower Revised.....	9.00	1.65	1.00
Lazaretto Ammoniated Superphosphate with Potash.....	8.00	2.47	1.00
Lazaretto Special Tobacco and Potato Fertilizer.....	8.00	2.47	2.00
Quinnipiac Pine Island Ammo. Bone Phosphate.....	8.50	1.85	1.25
Slingluff's British Mixture.....	8.00	2.06	2.00
The American Agri. Chem. Co.'s Superphosphate.....	16.00	....	....
Top Notch Cotton Seed Meal Cpd., Revised.....	9.00	1.65	1.00
"2¼-9-1 Fertilizer".....	9.00	1.85	1.00
Cotton Seed Meal Compound, Revised.....	8.00	2.47	1.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Ammoniated Fertilizer with Potash.....	9.00	1.65	1.00
Ammoniated Superphosphate with Potash.....	8.00	2.47	1.00
Gold Eagle Tobacco Fertilizer.....	9.00	2.47	2.00
H. G. Ammo. Superphosphate with Potash.....	8.00	3.29	1.00
Ammoniated Superphosphate	12.00	1.65	....
Ammoniated Fertilizer A	11.00	.82	....
Ammoniated Fertilizer AA	10.00	1.65	....
Ammoniated Fertilizer AAA	10.00	2.47	....
Ammoniated Fertilizer AAAA	10.00	3.29	....
Ammoniated Fertilizer	8.00	3.29	....
Carolina Formula	6.00	3.29	....
"2-9-2 Fertilizer"	9.00	1.65	2.00
"3-9-0 Fertilizer"	9.00	2.47	....
Nitrate of Soda.....	....	15.00	....
Dry Ground Fish.....	6.00	8.23	....
Zell's 16 per cent Acid Phosphate.....	16.00	....	....
Zell's Fish Guano, Revised.....	9.00	1.65	1.00
Zell's Special Compound for Tobacco.....	8.00	1.65	2.00
Zell's Bright Tobacco Grower, Revised.....	8.00	2.47	2.00
Zell's H. G. Ammoniated Superphosphate with Potash.....	8.00	2.47	1.00
The Amer. Agl. Chem. Co. ....	....	....	....
12 per cent Acid Phosphate.....	12.00	....	....
13 per cent Acid Phosphate.....	13.00	....	....
14 per cent Acid Phosphate.....	14.00	....	....
Canton Chemical Game Guano, Revised.....	9.00	1.65	1.00
Baker's Special Fertilizer.....	10.00	.82	1.00
Detrick's K. K. K. Ammo. Superphosphate with Potash.....	9.00	2.47	1.00
Detrick's Ammoniated Superphosphate with Potash.....	9.00	2.06	1.00
Detrick's Fish Guano.....	9.00	1.65	1.00
Lazaretto H. G. Ammo. Superphosphate with Potash.....	8.00	3.29	1.00
Zell's Calvert Guano, Revised.....	9.00	1.65	1.00
Zell's Ammo. Superphosphate with Potash.....	9.00	1.85	1.00
Zell's Cotton Compound	10.00	1.65	1.00
Savage & Son and Co.'s Purity Guano.....	8.00	1.65	2.00
Holmes & Dawson's Triumph Soluble Guano.....	8.00	1.65	2.00

AMERICAN FERTILIZER COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
American Potato Compound	6.00	5.76	1.00
American Standard Crop Grower.....	5.00	5.76	1.00
American 14 and 2 Ammoniated Compound.....	14.00	1.65	....
American 12 and 3 Ammoniated Compound.....	12.00	2.47	....
American 12 and 2 Ammoniated Compound.....	12.00	1.65	....
American 11 and 3 Ammoniated Compound.....	11.00	2.47	....
American 10 and 4 Ammoniated Compound.....	10.00	3.29	....
American 10 and 3 Ammoniated Compound	10.00	2.47	....
American 10 and 2 Ammoniated Compound.....	10.00	1.65	....
American 9 and 4 Ammoniated Compound.....	9.00	3.29	....
American 9 and 3 Ammoniated Compound.....	9.00	2.47	....
American 8 and 4 Ammoniated Compound.....	8.00	3.29	....
American 7 and 7 Ammoniated Compound.....	7.00	5.76	....
American 7 and 4 Ammoniated Compound.....	7.00	3.29	....
American 6 and 7 Ammoniated Compound.....	6.00	5.76	....
American 6 and 4 Ammoniated Compound.....	6.00	3.29	....
American 4 and 10 Ammoniated Compound.....	4.00	8.23	....
American High Grade Acid Phosphate.....	16.00	....	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
High Grade Acid Phosphate.....	14.00	....	....
Acid Phosphate	13.00	....	....
Tip Top Tobacco Grower.....	8.00	3.29	3.00
American Eagle Guano.....	8.00	2.47	3.00
J. G. Miller & Co.'s Yellow Leaf Fertilizer.....	8.00	2.47	3.00
American O. K. Guano.....	8.00	1.65	3.00
Stable Manure Substitute.....	7.00	3.29	3.00
Pelican Crop Grower.....	9.00	2.26	2.00
Pitt County Special Fertilizer, Revised.....	9.00	2.88	2.00
Special Formula Guano for Yellow Leaf Tob., Revised.....	9.00	2.88	2.00
American No. 1 Fertilizer.....	8.00	2.47	2.00
American Champion Tobacco Grower, Revised.....	8.00	2.47	2.00
Bob White Fertilizer for Tobacco, Revised.....	8.00	2.06	2.00
Bone and Peruvian Guano.....	8.00	1.65	2.00
A. L. Hannah's Special Formula Guano.....	8.00	1.65	2.00
Peruvian Mixture Guano.....	8.50	1.65	1.50
American Standard Cotton Grower, Revised.....	10.00	1.65	1.00
Capital King Cotton Grower, Revised.....	9.00	2.26	1.00
American Panacea Guano.....	9.00	1.65	1.00
Blood and Bone Compound.....	8.50	2.06	1.00
N. C. and S. C. Cotton Grower, Revised.....	8.00	3.29	1.00
Wizard Crop Grower.....	8.00	2.47	1.00
American 7 per cent Guano.....	7.00	5.76	1.00
American Fish Scrap Guano, Revised.....	7.00	3.29	1.00
Peruvian Mixture Guano for Sweet Potatoes.....	8.00	3.29	1.00
J. J. White's Special Formula for Tobacco.....	8.00	2.47	3.00
American 6-5-2 Fertilizer	6.00	4.12	2.00
American 6 and 5 Ammoniated Compound.....	6.00	4.12	....

ARMOUR FERTILIZER WORKS,
GREENSBORO, CHICAGO, AND WILMINGTON.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Fertilizer No. 92022.....	9.20	1.65	2.00
Fertilizer No. 957	9.00	4.11	7.00
Fertilizer No. 934.....	9.00	2.47	4.00
African Cotton Grower.....	9.00	2.47	3.00
Fertilizer No. 933.....	9.00	2.47	3.00
Armour's Tobacco Champion.....	9.00	2.47	3.00
Fertilizer No. 932.....	9.00	2.47	2.00
Fertilizer No. 931.....	9.00	2.47	1.00
Special Mixture	9.00	2.47	....
Johnson's High Grade.....	9.00	2.05	5.00
Carolina Special	9.00	2.05	3.00
Forsyth County Tobacco Special.....	9.00	2.05	3.00
Tobacco Fertilizer	9.00	1.85	4.00
Fertilizer No. 92 $\frac{1}{4}$ 4.....	9.00	1.85	4.00
Fertilizer No. 92 $\frac{1}{4}$ 3.....	9.00	1.85	3.00
Tobacco Fertilizer	9.00	1.65	5.00
Fertilizer No. 925.....	9.00	1.65	5.00
Fertilizer No. 924.....	9.00	1.65	4.00
Armour's Bright Tobacco Grower.....	9.00	1.65	3.00
Bone Dissolved Bone with Potash.....	9.00	1.65	3.00
Fertilizer No. 922.....	9.00	1.65	2.00
Fertilizer No. 921.....	9.00	1.65	1.00
Fertilizer No. 1233	12.00	2.47	3.00
Fertilizer No. 1134.....	11.00	2.47	4.00
Fertilizer No. 1121.....	11.00	1.65	1.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Special Tobacco Formula.....	10.00	3.50	6.25
Fertilizer No. 1045.....	10.00	3.30	5.00
Fertilizer No. 1044.....	10.00	3.30	4.00
Fertilizer No. 1043.....	10.00	3.30	3.00
Fertilizer No. 1042.....	10.00	3.30	2.00
Fertilizer No. 1033.....	10.00	2.47	3.00
Fertilizer No. 1032.....	10.00	2.47	2.00
Ammonia Compound	10.00	2.47	....
Fertilizer No. 1025.....	10.00	1.65	5.00
Fertilizer No. 1023.....	10.00	1.65	3.00
Hartman's Animal Bone.....	10.00	1.65	3.00
Armour's Wheat Grower.....	10.00	1.65	2.00
Ammoniated Dissolved Bone and Potash.....	10.00	1.65	2.00
Fertilizer No. 1021.....	10.00	1.65	1.00
Ammonia Compound	10.00	1.65	....
Special Mixture	10.00	1.03	6.00
Armour's Special Guano.....	10.00	.82	3.00
Fertilizer No. 1012.....	10.00	.82	2.00
Fertilizer No. 1011.....	10.00	.82	1.00
Fertilizer No. 913.....	9.00	.82	3.00
Fertilizer No. 912.....	9.00	.82	2.00
Tobacco Fertilizer	8.50	1.65	2.00
Standard Cotton Grower.....	8.50	1.65	2.00
Truck Fertilizers (875)	8.00	5.76	5.00
Fertilizer No. 875.....	8.00	5.76	5.00
Blood, Bone, and Potash.....	8.00	4.11	7.00
Young's Special	8.00	4.11	3.00
Van Lindley's Special.....	8.00	4.11	2.00
Fertilizer No. 846.....	8.00	3.30	6.00
Fertilizer No. 845.....	8.00	3.30	5.00
Fertilizer No. 844.....	8.00	3.30	4.00
Armour's Tobacco Grower.....	8.00	3.30	4.00
Special Trucker	8.00	3.30	4.00
Fertilizer No. 843.....	8.00	3.30	3.00
Fertilizer No. 842.....	8.00	3.30	2.00
Truck and Berry Special.....	8.00	2.47	10.00
Fertilizer No. 837.....	8.00	2.47	7.00
Armour's 836 for Tobacco.....	8.00	2.47	6.00
Fertilizer No. 836.....	8.00	2.47	6.00
Special for Tobacco.....	8.00	2.47	5.00
Fertilizer No. 835.....	8.00	2.47	5.00
Fertilizer No. 834.....	8.00	2.47	4.00
Underwood's Favorite	8.00	2.47	3.00
Cotton Special	8.00	2.47	3.00
Tobacco Special	8.00	2.47	3.00
Fertilizer No. 833.....	8.00	2.47	3.00
Fertilizer No. 832.....	8.00	2.47	2.00
Fertilizer No. 831.....	8.00	2.47	1.00
Berry King	8.00	2.05	4.00
Fertilizer 82½3	8.00	2.05	3.00
Sweet Potato Special.....	8.00	2.05	3.00
Gold Medal for Tobacco.....	8.00	2.05	3.00
Champion	8.00	2.05	2.50
King Cotton	8.00	2.05	2.00
Slate's Tobacco Special.....	8.00	1.85	4.00
High Grade Potato.....	8.00	1.65	10.00
Fertilizer No. 826.....	8.00	1.65	6.00
Stokes' County Tobacco Special	8.00	1.65	5.00
Fruit and Root Crop Special.....	8.00	1.65	5.00
Fertilizer No. 825.....	8.00	1.65	5.00
Fertilizer No. 824.....	8.00	1.65	4.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Fertilizer No. 823.....	8.00	1.65	3.00
Carolina Cotton Special.....	8.00	1.65	3.00
Slaughter House for Tobacco.....	8.00	1.65	2.00
Armour's Slaughter House Fertilizer.....	8.00	1.65	2.00
General	8.00	1.65	2.00
Fertilizer No. 815.....	8.00	.82	5.00
Fertilizer No. 814.....	8.00	.82	4.00
Fertilizer No. 813.....	8.00	.82	3.00
Armour's Extra Trucker.....	7.00	5.76	7.00
Fertilizer No. 758.....	7.00	4.11	8.00
Allen's Tobacco Special.....	7.00	4.11	8.00
Armour's Trucker	7.00	4.11	5.00
Fertilizer No. 743.....	7.00	3.30	3.00
Armour's 7 per cent Trucker.....	6.00	5.76	5.00
Armour's 5 per cent Trucker.....	6.00	4.11	7.00
Fertilizer No. 648.....	6.00	3.30	8.00
Fertilizer No. 647.....	6.00	3.30	7.00
Manure Substitute	6.00	3.30	4.00
Armour's Velvet Leaf for Tobacco.....	6.00	2.47	7.00
Fertilizer No. 637.....	6.00	2.47	7.00
Fertilizer No. 633.....	6.00	2.47	3.00
10 per cent Trucker.....	5.00	8.23	3.00
Armour's Top Dresser.....	5.00	8.23	2.00
Fertilizer No. 544.....	5.00	3.30	4.00
Armour's Top Dresser.....	4.00	8.23	4.00
Armour's Top Dresser.....	4.00	6.18	2.50
Pitt County Special Tobacco.....	4.00	3.30	6.00
Special Formula for Tobacco.....	4.00	3.30	5.00
Fertilizer No. 444.....	4.00	3.30	4.00
Harris Electric Top Dresser.....	2.00	8.23	3.00
Armour's Top Dresser.....	....	7.81	4.00
Armour's Top Dresser.....	....	7.40	3.00
"Nitrolene" .....	....	7.40	3.00
Phosphate and Potash.....	15.00	....	2.00
Phosphate and Potash.....	13.00	....	2.00
Golden Grain Grower.....	13.00	....	4.00
Phosphate and Potash.....	12.00	....	6.00
Phosphate and Potash.....	12.00	....	5.00
Phosphate and Potash.....	12.00	....	4.00
Phosphate and Potash.....	12.00	....	3.00
Phosphate and Potash.....	12.00	....	2.00
Sampron's Corn Mixture.....	11.00	....	5.00
Phosphate and Potash.....	11.00	....	1.00
Phosphate and Potash.....	10.00	....	6.00
Phosphoric Acid and Potash.....	10.00	....	5.00
Superphosphate and Potash.....	10.00	....	4.00
Acid and Potash.....	10.00	....	3.00
Phosphate and Potash No. 1.....	10.00	....	2.00
Armour's Phosphate and Potash.....	9.00	....	3.00
Phosphate and Potash No. 2.....	8.00	....	5.00
Phosphate and Potash No. 3.....	8.00	....	4.00
Acid Phosphate	17.00	....	....
Acid Phosphate	16.00	....	....
Star Phosphate	14.00	....	....
Acid Phosphate	13.00	....	....
Acid Phosphate	12.00	....	....
Kainit .....	....	....	12.00
Muriate of Potash.....	....	....	50.00
Sulphate of Potash.....	....	....	50.00
Nitrate of Soda.....	....	14.81	....
Dried Blood .....	....	13.16	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
10 per cent Tankage.....	....	8.23	....
Tankage .....	....	6.58	....
Bone Meal (Total).....	24.00	2.47	....
Raw Bone Meal (Total).....	22.00	3.70	....
Cotton Seed Meal.....	....	6.18	....
Sulphate of Ammonia.....	....	20.56	....
Special Grain Fertilizer.....	10.00	.62	2.00
Ammoniated Superphosphate	12.00	3.30	....
Ammoniated Superphosphate	12.00	2.47	....
Ammoniated Superphosphate	12.00	.82	....
Ammoniated Superphosphate	11.00	3.30	....
Ammoniated Superphosphate	11.00	2.47	....
Ammoniated Superphosphate	11.00	1.65	....
Ammoniated Superphosphate	11.00	.82	....
Ammoniated Superphosphate	10.00	4.11	....
Ammoniated Superphosphate	10.00	3.30	....
Fertilizer No. 1031.....	10.00	2.47	1.00
Ammoniated Superphosphate	10.00	2.47	....
Special Grain Fertilizer.....	10.00	.41	2.00
Special Grain Fertilizer.....	10.00	.20	2.00
Grain Special	10.00	1.65	....
Fertilizer No. 1011 for Grain.....	10.00	.82	1.00
Ammoniated Superphosphate	9.00	3.30	....
Ammoniated Superphosphate	9.00	2.47	....
Tobacco Fertilizer	9.00	2.27	2.00
Fertilizer No. 92 ½ 1.....	9.00	2.05	1.00
Fertilizer No. 921 for Grain.....	9.00	1.65	1.00
Fertilizer No. 862.....	8.00	4.94	2.00
Fertilizer No. 853.....	8.00	4.11	3.00
Fertilizer No. 851.....	8.00	4.11	1.00
Ammoniated Superphosphate	8.00	4.11	....
Fertilizer No. 841.....	8.00	3.30	1.00
Tobacco Fertilizer	8.00	2.47	2.00
Ammoniated Superphosphate	8.00	3.30	....
Fertilizer No. 831 for Grain.....	8.00	2.47	1.00
Fertilizer No. 82 ½ 1.....	8.00	2.05	1.00
Slaughter House for Grain.....	8.00	1.65	2.00
Fertilizer No. 752.....	7.00	4.11	2.00
Fertilizer No. 751.....	7.00	4.11	1.00
Ammoniated Superphosphate	7.00	4.11	....
Fertilizer No. 642.....	6.00	3.30	2.00
Ammoniated Superphosphate	6.00	3.30	....
Fertilizer No. 753.....	7.00	4.11	3.00
Fertilizer No. 861.....	8.00	4.94	1.00
Ammoniated Superphosphate	8.00	4.94	....
Special Mixture	10.00	1.23	4.00

GEORGE L. ARPS & CO.,

NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Arps' High Grade 16 per cent Acid Phosphate.....	16.00	....	....
Arps' Substitute Brand	10.00	3.29	....
Arps' Bumper Mixture	9.00	2.47	2.00
Arps' Restoration Brand	9.00	2.47	1.00
Arps' Acid Phosphate and Ammonia Mixture.....	9.00	2.47	....
Arps' Quick Step Brand.....	8.00	3.30	....
Arps' Sharpshooter Brand	8.00	2.47	1.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Arps' Winona	6.00	3.30	....
Arps' Oceana Top Dresser.....	4.00	8.23	....
Arps' Racine Top Dresser	4.00	7.40	3.00
Arps' New Brand Top Dresser.....	3.00	7.40	....
Arps' 10 per cent Fish Scrap.....	4.00	8.23	....
Arps' Special Guano	8.00	3.30	1.00
Arps' Special Potato Guano.....	7.00	4.11	2.00
Arps' Rosemary Brand	7.00	4.11	1.00

ASHCRAFT-WILKINSON COMPANY,

ATLANTA, GA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Nitrate of Soda.....	15.00	....

ATLANTIC CHEMICAL CORPORATION,

NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Atlantic High Grade 16 per cent Acid Phosphate.....	16.00	....	....
Atlantic 14 per cent Acid Phosphate.....	14.00	....	....
Atlantic Dissolved Bone	13.00	....	....
Atlantic Mecca Ammoniated Phosphate.....	12.00	1.65	....
Atlantic Corn Special	12.00	1.03	2.00
Atlantic Bone and Potash Mixture.....	12.00	....	2.00
Atlantic Acid Phosphate	12.00	....	....
Atlantic Upkeep Ammoniated Phosphate.....	11.00	2.47	....
Atlantic 11 and 5 Bone and Potash Mixture.....	11.00	....	5.00
Atlantic Dorcas Special Truck Compound.....	10.00	4.94	....
Atlantic Drum Major Ammoniated Phosphate.....	10.00	3.30	....
Atlantic Cowboy Meal Mixture.....	10.00	2.47	1.00
Atlantic Leda Fertilizer	10.00	2.47	1.00
Atlantic Padlock Ammoniated Phosphate.....	10.00	2.47	....
Atlantic Wyandotte Fertilizer	10.00	1.65	1.00
Atlantic Sunset Ammoniated Phosphate.....	10.00	1.65	....
Atlantic Fellowship Fertilizer	10.00	.82	1.00
Atlantic 10 and 5 Bone nad Potash Mixture.....	10.00	....	5.00
Atlantic 10 and 4 Bone and Potash Mixture.....	10.00	....	4.00
Atlantic Bone and Potash for Grain.....	10.00	....	3.00
Atlantic Bone and Potash Mixture.....	10.00	....	2.00
Atlantic Mira Ammoniated Phosphate.....	9.00	3.30	....
Acco Tobacco Compound.....	9.00	2.47	3.00
Atlantic Snowflake Fertilizer	9.00	2.47	1.00
Atlantic Orlando Ammoniated Phosphate	9.00	2.47	....
Atlantic Meal Compound	9.00	2.26	2.00
Atlantic Warhorse Meal Mixture.....	9.00	2.26	1.00
Atlantic Cotton Grower	9.00	2.06	1.00
Atlantic Corona Cotton Compound	9.00	1.65	3.00
Atlantic Special Guano	9.00	1.65	1.00
Atlantic Grain Guano	9.00	.82	3.00
Atlantic Fish Guano	9.00	.82	3.00
Atlantic Special 9-1-2 Guano	9.00	.82	2.00
Atlantic Omar Tobacco Fertilizer	8.50	1.65	2.00
Atlantic Steadfast 7 Per Cent Ammoniated Phosphate.....	8.00	5.76	....
Atlantic Hector Truck Compound.....	8.00	4.12	1.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Atlantic Speedwell Special Trucker.....	8.00	4.12	....
Atlantic Special Truck Guano.....	8.00	3.30	4.00
Atlantic Wigwam High Grade Guano.....	8.00	3.30	4.00
Atlantic Paloma Tobacco Guano.....	8.00	3.30	4.00
Atlantic Ironclad Fertilizer.....	8.00	3.30	2.00
Atlantic Cuckoo Tobacco Guano.....	8.00	3.30	2.00
Atlantic Moose Brand Fertilizer.....	8.00	3.30	1.00
Atlantic Otter Tobacco Guano.....	8.00	2.88	5.00
Pitt County Light Tobacco Special.....	8.00	2.47	5.00
Boone's Special.....	8.00	2.47	4.00
Atlantic High Grade Tobacco Guano.....	8.00	2.47	3.00
Atlantic High Grade Cotton Guano.....	8.00	2.47	3.00
Bearpond Special Tobacco Guano.....	8.00	2.47	3.00
Atlantic Fawn Brand Tobacco Guano.....	8.00	2.47	2.00
Atlantic Alba Tobacco Grawer.....	8.00	2.47	1.00
Atlantic Cadet Fertilizer.....	8.00	2.47	1.00
Atlantic Halo Meal Compound.....	8.00	2.47	1.00
Atlantic Tobacco Grower.....	8.00	2.06	3.00
Atlantic Tobacco Compound.....	8.00	2.06	2.00
Atlantic Soluble Guano.....	8.00	1.65	2.00
Atlantic Soluble Guano for Tobacco.....	8.00	1.65	2.00
Atlantic Special Wheat Fertilizer.....	8.00	1.65	2.00
Atlantic Bugle Peanut Guano.....	8.00	1.03	4.00
Atlantic Secca Ammoniated Phosphate.....	8.00	3.30	....
Atlantic 8 and 5 Bone and Potash Mixture.....	8.00	....	5.00
Atlantic 8 and 4 Bone and Potash Mixture.....	8.00	....	4.00
Atlantic Topaz Truck Guano.....	7.00	5.76	7.00
Atlantic Vitus Ammoniated Phosphate.....	7.00	4.94	....
Acco Potato Manure.....	7.00	4.12	7.00
Atlantic Potato Guano.....	7.00	4.12	5.00
Atlantic Passbook 5 Per Cent Potato Guano.....	7.00	4.12	1.00
Atlantic 5 Per Cent Ammoniated Phosphate.....	7.00	4.12	....
Atlantic Lighthouse Peanut Grower.....	7.00	....	5.00
Acco 7 Per Cent Trucker.....	6.00	5.76	5.00
Atlantic Cashier 7 Per Cent Potato Guano.....	6.00	5.76	1.00
Atlantic 7 per cent Ammoniated Phosphate.....	6.00	5.76	....
Atlantic Special Potato Guano.....	6.00	4.12	7.00
Atlantic Bamboo Truck Fertilizer.....	6.00	4.12	5.00
Atlantic Dublin 5 per cent Truck Compound.....	6.00	4.12	1.00
Atlantic Light Land Special Fertilizer.....	6.00	3.30	....
Acco 10 Per Cent Truck Guano.....	5.00	8.23	3.00
Atlantic Oceana Trucker.....	5.00	8.23	2.50
Atlantic Simoon 10 Per Cent Truck Compound.....	5.00	8.23	....
Atlantic Vita Truck Grower.....	5.00	5.76	5.00
Atlantic Buttercup 7 Per Cent Potato Guano.....	5.00	5.76	1.00
Atlantic Side Dresser.....	4.00	8.23	4.00
Atlantic Fourteno Top Dresser.....	4.00	8.23	....
Atlantic Ground Fish Scrap.....	4.00	8.23	....
Atlantic Special Top Dresser.....	4.00	6.17	2.50
Atlantic Threenineo Top Dresser.....	3.00	7.40	....
Atlantic Top Dresser.....	....	7.40	3.00
Atlantic Pure Raw Bone Meal (Total).....	21.50	3.70	....
Atlantic Ground Tankage.....	6.00	8.23	....
Nitrate of Soda.....	....	15.21	....
Acco Thomas Phosphate.....	17.00	....	....
Cotton Seed Meal.....	....	6.17	....
Sulphate of Potash.....	....	....	48.00
Muriate of Potash.....	....	....	48.00
Genuine German Kainit.....	....	....	12.00
Atlantic Landslide Truck Compound.....	6.00	5.76	3.00

THE BARRETT COMPANY,
NEW YORK CITY.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Arcadian Sulphate of Ammonia.....	20.75	....

BAUGH & SONS CO.,
PHILADELPHIA, PA., AND NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Baugh's Raw Bone Meal, Warranted Pure (Total)	21.50	3.70	....
Baugh's Fine Ground Bone (Total)	16.49	2.47	....
Baugh's 16 Per Cent Acid Phosphate.....	16.00	....	....
Baugh's High Grade Acid Phosphate.....	14.00	....	....
Baugh's Pure Dissolved Animal Bones.....	13.00	2.06	....
Baugh's Grand Rapid Guano	9.00	2.47	1.00
Baugh's Fish Mixture	9.00	1.65	1.00
Baugh's Animal Base and Potash Compound for All Crops...	9.00	1.65	1.00
Baugh's Peruvian Guano Substitute for Potatoes and All Vegetables	8.00	4.12	1.00
Baugh's New Process 10 per cent Guano.....	5.00	8.23	....
Baugh's Half and Half Mixture (Total)	19.00	1.23	....
Baugh's High Grade Ammoniated Animal Base.....	10.00	3.30	....
Baugh's Old Stand-by (Dissolved Animal Base).....	12.00	1.65	....
Baugh's Effective Animal Base Manure.....	10.00	3.30	1.00
Baugh's Complete Animal Base Fertilizer.....	10.00	1.65	1.00
Baugh's Norfolk Special Guano	8.00	5.76	....
Baugh's Ammoniated Superphosphate	10.00	2.47	....
Sulphate Ammonia .....	....	20.57	....
Nitrate Soda .....	....	15.22	....
Baugh's Yucatan Special Tobacco Guano.....	8.00	2.47	3.00
Baugh's "Old Stand-by" Compound for Tobacco.....	8.00	1.65	2.00
Baugh's Colonial Tobacco Guano	9.00	2.06	2.00
Baugh's High Grade Tobacco Guano.....	8.00	2.47	2.00
Baugh's Ammpos Soil and Crop Fertilizer.....	8.00	4.12	....
Baugh's Durable Plant Food.....	8.00	1.65	2.00
Baugh's Non-Potash Mixture	9.00	2.47	....
Baugh's Nitrophos Soil and Crop Fertilizer.....	8.00	3.30	....
Fine Ground Dried Blood .....	....	12.00	....
Baugh's Maximum Potato Guano	6.00	5.76	3.00
Baugh's Tri-Unit Potato Guano	8.00	4.12	3.00
Baugh's Fish Bone and Potash	8.00	3.30	2.00
Baugh's Wheat Fertilizer for Wheat and Grass.....	8.00	1.65	2.00
Baugh's Grain and Grass Grower	10.00	.82	1.00
Baugh's Soluble Top Dresser .....	....	8.25	3.00
Baugh's Accelerator—A Complete Top Dresser	4.00	6.58	4.00
Baugh's Admiration Top Dresser.....	....	8.25	2.00
Baugh's Ceres Harvest Goddess .....	....	7.40	3.00
Baugh's Departmental Guano	6.00	3.30	....
Baugh's Pure Steamed Bone	25.19	1.65	....
Baugh's High Grade Tankage (Total)	4.00	5.76	....
Baugh's Ground Fish	5.00	8.23	....
Baugh's 7 Per Cent Potato Guano.....	6.00	5.76	1.00

THE BERKLEY CHEMICAL COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Berkley Acid Phosphate	14.00	....	....
Resolute Acid Phosphate	16.00	....	....
Laurel Potash Mixture	10.00	....	2.00
Long Leaf Tobacco Grower.....	8.00	1.65	2.00
Select Crop Grower	8.50	2.06	2.50
Advance Crop Grower.....	8.00	2.47	3.00
Berkley Tobacco Guano	8.00	2.47	3.00
Mascot Truck Guano	7.00	4.11	5.00
Royal Truck Grower	6.00	5.76	5.00
Berkley Plant Food	10.00	....	4.00
Superior Bone and Potash.....	8.00	....	4.00
Monitor Animal Bone Fertilizer.....	9.00	1.85	4.00
Victory Special Crop Grower.....	8.00	3.29	4.00
The Leader of the World.....	5.00	3.29	5.00
Berkley 1-11-0 Fertilizer	11.00	.82	....
Berkley 1-10-1 Fertilizer	10.00	.82	1.00
Berkley 2-10-0 Fertilizer	10.00	1.65	....
Berkley 2-11-0 Fertilizer	11.00	1.65	....
Berkley 2-12-0 Fertilizer	12.00	1.65	....
Berkley 2-9-1 Fertilizer	9.00	1.65	1.00
Berkley 2-10-1 Fertilizer	10.00	1.65	1.00
Berkley Crop Grower	8.00	1.65	2.00
Berkley 2-9-2 Fertilizer	9.00	1.65	2.00
Berkley 2¼-9-1 Fertilizer	9.00	1.85	1.00
Monitor Animal Bone Special	9.00	1.85	2.00
Berkley 2½-10-1 Fertilizer	10.00	2.06	1.00
Berkley 3-9-0 Fertilizer	9.00	2.47	....
Berkley 3-8-1 Fertilizer	8.00	2.47	1.00
Berkley Tobacco Special	8.00	2.47	2.00
Berkley 3-8-2 Fertilizer	8.00	2.47	2.00
Berkley 3-9-1 Fertilizer	9.00	2.47	1.00
Berkley 3-9-2 Fertilizer	9.00	2.47	2.00
Berkley 3-10-0 Fertilizer	10.00	2.47	....
Berkley 4-6-0 Fertilizer	6.00	3.29	....
Berkley 4-8-0 Fertilizer	8.00	3.29	....
Berkley 4-8-2 Fertilizer	8.00	3.29	2.00
Berkley 4-10-0 Fertilizer	10.00	3.29	....
Berkley 5-8-0 Fertilizer	8.00	4.11	....
Berkley 5-7-0 Fertilizer	7.00	4.11	....
Berkley 5-7-1 Fertilizer	7.00	4.11	1.00
Berkley 7-6-0 Fertilizer	6.00	5.76	....
Berkley 7-6-2 Fertilizer	7.00	5.76	2.00
Berkley 5-7-2 Fertilizer	7.00	4.11	2.00
Berkley 7-8-0 Fertilizer	8.00	5.76	....
Berkley 7-8-1 Fertilizer	8.00	5.76	1.00
Berkley 7-8-2 Fertilizer	8.00	5.76	2.00
Berkley 7-6-1 Fertilizer	6.00	5.76	1.00
Berkley 10-5-0 Fertilizer	5.00	8.23	....
Berkley 10-5-1 Fertilizer	5.00	8.23	1.00
Berkley 10-5-2 Fertilizer	5.00	8.23	2.00
Berkley 9-3-0 Top Dresser.....	3.00	7.41	....
Berkley 9-4-0 Top Dresser.....	4.00	7.41	....
Berkley 10-5-0 Top Dresser.....	5.00	8.23	....
Berkley 10-5-1 Top Dresser.....	5.00	8.23	1.00
Berkley 10-4-2 Top Dresser.....	4.00	8.23	2.00
Berkley 4-8-1 Fertilizer	8.00	3.29	1.00
Nitrate of Soda .....	....	15.00	....

S. T. BEVERIDGE & CO.,
RICHMOND, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Thomas or Basic Slag.....	18.00	....	....

BIRMINGHAM FERTILIZER COMPANY,
BIRMINGHAM, ALA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Birmingham Tobacco Special	8.00	2.47	3.00
Birmingham Tobacco Special, Revised	8.00	2.47	2.00

BLACKSTONE GUANO COMPANY, INC.,
BLACKSTONE, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Clover Leaf 16 Per Cent Phosphate.....	16.00	....	....
Bone and Phosphate Half and Half (Total)	15.00	1.65	....
King of Corn	14.50	1.03	....
Virginia Tobacco Grower.....	11.00	2.47	....
Bright Tobacco Special	10.00	1.65	....
Old Bellefonte Special	10.00	3.30	....
Bellefonte	8.00	2.47	2.00
Red Letter	8.00	1.65	2.00
Alliance	8.00	1.65	2.00
Tobacco Compound	10.00	1.65	1.00
Blackstone Raw Bone (Total).....	20.00	3.70	....
Animal Bone (Total)	22.50	2.47	....

THE BOYKIN CHEMICAL AND FERTILIZER COMPANY,
BALTIMORE, MD.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Boykin's Top Dresser	7.41	3.00
Boykin's Top Dresser No. 2-B.....	7.41	2.00
Boykin's Top Dresser No. 3-C.....	7.41	1.00

BOWKER FERTILIZER COMPANY,
(Subsidiary of the American Agricultural Chemical Company.)
NEW YORK AND BOSTON, MASS.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Bowker's High Grade Soluble Phosphate.....	16.00	....	....
Bowker's Empire Standard Revised.....	9.00	1.65	1.00
Bowker's Cotton-Seed Meal Compound	9.00	1.65	1.00
Bowker's Gold Eagle Tobacco Fertilizer.....	8.00	2.39	2.00
Bowker's High Grade Cotton-Seed Meal Compound.....	8.00	2.47	1.00
Bowker's Tobacco Fertilizer Revised.....	8.00	2.47	2.00
Bowker's Ammoniated Superphosphate with Potash.....	9.00	2.47	1.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Bowker's H. G. Ammoniated Superphosphate with Potash....	8.00	3.29	1.00
Bowker's 2-10-0 Fertilizer	10.00	1.65	....
Bowker's 1-11-0 Fertilizer	11.00	.82	....
Bowker's 2-12-0 Fertilizer	12.00	1.65	....
Bowker's 3-10-0 Fertilizer	10.00	2.47	....
Bowker's 4-10-0 Fertilizer	10.00	3.29	....
Bowker's 4-8-0 Fertilizer	8.00	3.29	....
Bowker's 4-6-0 Fertilizer	6.00	3.29	....

BRAGAW FERTILIZER COMPANY,

WASHINGTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Cotton Seed Meal	6.18	....
Fish Scrap	8.66	....

H. P. BROWN GUANO COMPANY,

SALISBURY, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Brown's 12-4-4 Guano	12.00	3.29	4.00
Brown's 12-2-4 Guano	12.00	1.65	4.00
Brown's 10-4-4 Guano	10.00	3.29	4.00
Brown's 10-3-3 Guano	10.00	2.47	3.00
Brown's 10-2-2 Guano	10.00	1.65	2.00
Brown's 10-1 1/4-6 Guano	10.00	1.03	6.00
Brown's 9-3-6 Guano	9.00	2.47	6.00
Brown's 9-3-4 Guano	9.00	2.47	4.00
Brown's 9-3-3 Guano	9.00	2.47	3.00
Brown's 9-2 3/4-2 Guano	9.00	2.26	2.00
Brown's 9-2 1/4-4 Guano	9.00	1.85	4.00
Brown's 9-2-3 Guano	9.00	1.65	3.00
Brown's 9-1-3 Guano	9.00	.82	3.00
Brown's 9-1-2 Guano	9.00	.82	2.00
Brown's 9-2-1 Guano	9.00	1.65	1.00
Brown's 9-2 3/4-2 Tobacco Guano.....	9.00	2.26	2.00
Brown's 9-3-2 Guano	9.00	2.47	2.00
Brown's 12-3-1 Guano	12.00	2.47	1.00
Brown's 11-2-1 Guano	11.00	1.65	1.00
Brown's 10-1-1 Guano	10.00	.82	1.00
Brown's 8-4 1/2-7 Guano	8.00	3.71	7.00
Brown's 8-4 1/2-7 Tobacco Guano.....	8.00	3.71	7.00
Brown's 8-4-6 Guano	8.00	3.29	6.00
Brown's 8-4-6 Tobacco Guano.....	8.00	3.29	6.00
Brown's 8-4-4 Guano	8.00	3.29	4.00
Brown's 8-4-2 Guano	8.00	3.29	2.00
Brown's 8-3-10 Guano	8.00	2.47	10.00
Brown's 8-3-7 Guano	8.00	2.47	7.00
Brown's 8-3-7 Tobacco Guano	8.00	2.47	7.00
Brown's 8-3-6 Guano	8.00	2.47	6.00
Brown's 8-3-6 Tobacco Guano	8.00	2.47	6.00
Brown's 8-3-5 Guano	8.00	2.47	5.00
Brown's 8-3-5 Tobacco Guano	8.00	2.47	5.00
Brown's 8-3-4 Guano	8.00	2.47	4.00
Brown's 8-3-4 Tobacco Guano	8.00	2.47	4.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Brown's 8-3-3 Guano	8.00	2.47	3.00
Brown's 8-3-3 Tobacco Guano	8.00	2.47	3.00
Brown's 8-3-2 Guano	8.00	2.47	2.00
Brown's 8-3-1 Guano	8.00	2.47	1.00
Brown's 8-2½-3 Guano	8.00	2.06	3.00
Brown's 8-2½-3 Tobacco Guano.....	8.00	2.06	3.00
Brown's 8-2½-2 Guano	8.00	2.06	2.00
Brown's 8-2½-2 Tobacco Guano	8.00	2.06	2.00
Brown's 8-2-10 Guano	8.00	1.65	10.00
Brown's 8-2-5 Guano	8.00	1.65	5.00
Brown's 8-2-5 Tobacco Guano	8.00	1.65	5.00
Brown's 8-2-3 Guano	8.00	1.65	3.00
Brown's 8-2-3 Tobacco Guano	8.00	1.65	3.00
Brown's 8-2-2 Guano	8.00	1.65	2.00
Brown's 8-2-2 Tobacco Guano	8.00	1.65	2.00
Brown's 8-1-4 Guano	8.00	.82	4.00
Brown's 8-1-3 Guano	8.00	.82	3.00
Brown's 7-7-7 Guano	7.00	5.76	7.00
Brown's 7-5-8 Guano	7.00	4.12	8.00
Brown's 7-5-5 Guano	7.00	4.12	5.00
Brown's 7-4-5 Guano	7.00	3.29	5.00
Brown's 6-6-6 Guano	6.00	4.94	6.00
Brown's 6-4-7 Guano	6.00	3.29	7.00
Brown's 4-4-6 Guano	4.00	3.29	6.00
Brown's 4-7½-2 Top Dresser.....	4.00	6.17	2.00
Brown's 0-9-3 Top Dresser.....	....	7.40	3.00
Brown's 10-4 Ammoniated Compound.....	10.00	3.29	....
Brown's 10-3 Ammoniated Compound.....	10.00	2.47	....
Brown's 10-2 Ammoniated Compound.....	10.00	1.65	....
Brown's 12-2 Ammoniated Compound.....	12.00	1.65	....
Brown's 6-4 Ammoniated Compound.....	6.00	3.29	....
Brown's 14-2 Bone and Potash.....	14.00	....	2.00
Brown's 14-1 Bone and Potash.....	14.00	....	1.00
Brown's 12-6 Bone and Potash.....	12.00	....	6.00
Brown's 12-5 Bone and Potash.....	12.00	....	5.00
Brown's 12-4 Bone and Potash.....	12.00	....	4.00
Brown's 12-3 Bone and Potash.....	12.00	....	3.00
Brown's 12-2 Bone and Potash.....	12.00	....	2.00
Brown's 11-5 Bone and Potash.....	11.00	....	5.00
Brown's 11-2 Bone and Potash.....	11.00	....	2.00
Brown's 11-1 Bone and Potash.....	11.00	....	1.00
Brown's 10½-1½ Bone and Potash.....	10.50	....	1.50
Brown's 10-6 Bone and Potash.....	10.00	....	6.00
Brown's 10-5 Bone and Potash.....	10.00	....	5.00
Brown's 10-4 Bone and Potash.....	10.00	....	4.00
Brown's 10-3 Bone and Potash.....	10.00	....	3.00
Brown's 10-2 Bone and Potash.....	10.00	....	2.00
Brown's 8-5 Bone and Potash.....	8.00	....	5.00
Brown's 8-4 Bone and Potash.....	8.00	....	4.00
Brown's 20-12 Bone and Potash.....	20.00	....	12.00
Brown's 20-8 Bone and Potash.....	20.00	....	8.00
Brown's 16 Per Cent Acid Phosphate.....	16.00	....	....
Brown's 14 Per Cent Acid Phosphate.....	14.00	....	....
Brown's 13 Per Cent Acid Phosphate.....	13.00	....	....
Brown's 12 Per Cent Acid Phosphate.....	12.00	....	....
Brown's 24 Per Cent Acid Phosphate.....	24.00	....	....
Brown's 21.5-4.5 Bone Meal.....	21.5	3.70	....
Brown's 12 Per Cent Kainit.....	....	....	12.00
Brown's Nitrate of Soda.....	....	15.00	....
Brown's Muriate of Potash.....	....	....	48.00
Brown's Sulphate of Potash.....	....	....	48.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Brown's 10 Per Cent Fish Scrap .....	....	8.24	....
Brown's Thos. Phos. (Anchor Brand), 17 to 19 Per Cent Total.			
Brown's Ground Phosphate Rock, 28 Per Cent Total.			
Brown's Tankage	2.00	8.24	....
Brown's Dried Blood .....	....	13.00	....
Brown's Dissolved Animal Bone.....	13.00	2.06	....
Brown's Cotton Seed Meal.....	....	6.17	....
Brown's 10-1¼-4 Guano	10.00	1.03	4.00

BRYANT FERTILIZER COMPANY,

ALEXANDRIA, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Bryant's Acid Phosphate	12.00	....	....
Bryant's Wheat Special	10.00	.82	1.00
Bryant's Bone and Potash Mixture.....	12.00	....	2.00
Bryant's Bone and Potash Mixture.....	11.00	....	1.00
Bryant's Ammoniated Superphosphate	3.00	7.40	....
Sulphate of Ammonia .....	....	20.56	....
Bryant's Special Tobacco Mixture.....	8.50	1.65	1.50
Bryant's Ammoniated Superphosphate	4.00	6.58	....
Bryant's Ammoniated Superphosphate	4.00	8.23	....
Bryant's Ammoniated Superphosphate	5.00	9.05	....
Bryant's Ammoniated Superphosphate	4.00	4.94	....
Bryant's Ammoniated Superphosphate	6.00	8.23	....
Bryant's High Grade Guano, Revised.....	8.00	3.29	1.00
Bryant's Ammoniated Superphosphate	6.00	4.11	....
Bryant's Ammoniated Superphosphate	6.00	3.29	....
Bryant's Ammoniated Superphosphate	4.00	6.17	....
Bryant's Acid Phosphate	13.00	....	....
Bryant's High Grade Ammoniated Superphosphate.....	7.00	4.94	....
Bryant's Ammoniated Superphosphate	11.00	.82	....
Bryant's Choice C. S. M. 3 Per Cent Mixture, Revised.....	8.00	2.47	1.00
Bryant's Special C. S. M. Fertilizer, Revised.....	9.00	2.26	1.00
Bryant's Special Truck Fertilizer	7.00	4.11	2.00
Bryant's High Grade Tobacco Fertilizer, Revised.....	8.00	3.29	2.00
Bryant's High Grade Meal Fertilizer, Revised.....	8.00	3.29	2.00
Thomas Phosphate, 17 Total.			
Bryant's Carolina Special Top Dresser.....	....	7.40	3.00
Bryant's High Grade Ammoniated Superphosphate.....	12.00	2.47	....
Bryant's Standard Ammoniated Superphosphate.....	12.00	1.65	....
Bryant's Ammoniated Superphosphate	12.00	.82	....
Bryant's High Grade Superphosphate	10.00	3.29	....
Bryant's Standard Ammoniated Superphosphate.....	10.00	2.47	....
Bryant's Ammoniated Superphosphate	10.00	1.65	....
Bryant's Standard Ammoniated Superphosphate	9.00	2.47	....
Bryant's High Grade Ammoniated Superphosphate.....	8.00	3.29	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Genuine German Kainit .....	....	....	12.00
Pure Raw Bone (45 Per Cent Phos. of Lime Equiv. 20.60 T. P. A.) 3.70 (Eq. Ammo. 4.50).			
Nitrate of Soda .....	....	14.81	....
Blood .....	....	13.16	....
High Grade Tankage .....	....	8.23	....
Fish Scrap .....	....	9.05	....
Cotton Seed Meal .....	....	6.17	....
Bryant's High Grade Meal Fertilizer.....	8.00	3.29	4.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Bryant's Favorite Cotton Seed Meal Guano.....	8.00	2.47	3.00
Bryant's Victor Tobacco Fertilizer	8.00	2.47	3.00
Bryant's Choice C. S. M. 3 Per Cent Mixture.....	8.00	2.47	2.00
Bryant's Tobacco Fertilizer	8.00	2.06	3.00
Bryant's "Otter" Special Tobacco Fertilizer.....	8.00	2.06	3.00
Bryant's Meal Fertilizer	8.00	2.06	3.00
Bryant's Boll Special	8.00	2.47	4.00
Bryant's Cotton and Corn Fertilizer.....	8.00	2.06	2.00
Bryant's Special Fertilizer for Tobacco.....	8.00	2.06	2.00
Farmer's Mixture	8¾	1.85	4.00
Bryant's Cotton Grower	8.00	1.65	2.00
Bryant's Special Fertilizer	8.00	1.65	2.00
Bryant's Cotton Seed Meal Guano.....	8.00	1.65	2.00
Bryant's "Potomac" Bone Special for Tobacco.....	8.00	1.65	2.00
Bryant's Special Formula for Grain and Grass.....	8.00	.82	4.00
Bryant's Truck Grower	7.00	5.76	7.00
Bryant's Fish Scrap Guano	7.00	3.29	4.00
Bryant's Carolina Top Dresser	6.00	5.76	5.00
Bryant's High Grade Top Dresser.....	4.00	8.23	4.00
Bryant's Top Dresser	4.00	6.17	2.50
Bryant's Special Top Dresser	2.00	5.76	2.50
Bryant's Complete Fertilizer	9.00	1.65	1.00
Bryant's Grain Fertilizer	9.00	.82	2.00
Bryant's Standard Top Dresser	4.00	8.23	3.00
Bryant's Acid Phosphate	17.00	....	....
Bryant's Acid Phosphate	16.00	....	....
Bryant's Dissolved Bone	14.00	....	....
Bryant's High Grade Wheat Mixture.....	12.00	....	6.00
Parrish Godwin's Dissolved Bone with Potash.....	12.00	....	4.00
Bryant's Bone and Potash	10.00	....	5.00
Bryant's Bone and Potash	10.00	....	4.00
Bryant's Bone and Potash Mixture.....	10.00	....	2.00
Bryant's Wheat Mixture	8.00	....	4.00
Bryant's "Challenge" Highest Grade Tobacco Mixture.....	9.00	2.47	3.00
Bryant's Meal Mixture	9.00	2.47	3.00
Bryant's Special Cotton Seed Meal Fertilizer.....	9.00	2.26	2.00
Bryant's Bone Mixture for Tobacco	9.00	2.06	2.00
Carolina Wheat and Grain Guano.....	9.00	.82	3.00
Bryant's High Grade Guano	8.00	3.29	4.00
Bryant's High Grade Tobacco Fertilizer.....	8.00	3.29	4.00
Bryant's High Grade Fertilizer	8.00	2.47	3.00

THE C. J. BURTON GUANO COMPANY,

BALTIMORE, MD.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Burton's Special Fertilizer	8.00	3.30	1.00
Burton Choice	8.00	2.47	1.00
Burton's Best Fertilizer	8.00	2.47	2.00
Burton's Pimlico	9.00	1.65	1.00
Burton's Ammoniated Phosphate	9.00	2.47	....
Burton's Ammoniated Bone Phosphate	8.00	3.30	....
Burton's Pride	6.00	3.30	....
Burton's Club Brand	10.00	3.30	....
Burton's Butcher Bone	8.00	1.65	2.00
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
Burton's Unexcelled	10.00	1.65	....
Burton's Special Top Dressing.....	4.00	8.24	....

WILLIAM H. CAMP, INC.,
PETERSBURG, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Camp's Red Head Chemicals.....	8.00	2.47	2.00
Lion and Monkey Brand, Revised 1916.....	9.00	2.47	....
Lion and Monkey for Tobacco Revised 1917.....	8.00	2.47	2.00
Lion and Monkey for Tobacco.....	8.00	2.47	3.00
Lion and Monkey Brand Standard.....	8.00	1.65	2.00
Victory Brand Corn Grower, Revised 1916.....	10.00	1.65	....
Victory Brand Special	12.00	1.65	....
Cat and Rat Brand Peanut Grower.....	9.00	1.65	1.00
Lion and Monkey Brand 16 Per Cent.....	16.00	....	....
Nitrate of Soda .....	....	14.76	....
Machine Dried Fish Scrap.....	....	9.48	....

CARALEIGH PHOSPHATE AND FERTILIZER WORKS,
RALEIGH, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Comet Guano	8.00	.82	3.00
Caraleigh Top Dresser	3.00	8.23	4.00
Nitrate of Soda .....	....	15.65	....
Kanona Tankage .....	....	9.04	....
Dried Blood .....	....	13.16	....
Ground Fish .....	....	8.22	....
Formula 40 Guano	8.00	2.47	4.00
Oakdale Guano	8.00	2.67	3.00
8-4-1 Special	8.00	3.29	1.00
14-1-0 Ammoniated Phosphate	14.00	.82	....
12-2-0 Ammoniated Phosphate	12.00	1.65	....
10-4-0 Ammoniated Phosphate	10.00	3.29	....
10-3-0 Ammoniated Phosphate	10.00	2.47	....
10-2-0 Ammoniated Phosphate	10.00	1.65	....
9-3-0 Ammoniated Phosphate	9.00	2.47	....
8-4-0 Ammoniated Phosphate	8.00	3.29	....
8-3 1/4-0 Ammoniated Phosphate	8.00	2.67	....
7-4-0 Ammoniated Phosphate	7.00	3.29	....
6-5-0 Ammoniated Phosphate	6.00	4.11	....
6-4-0 Ammoniated Phosphate	6.00	3.29	....
5-5-0 Ammoniated Phosphate	5.00	4.11	....
4-6-0 Ammoniated Phosphate.....	4.00	4.93	....
McGee's Bright Leaf Tobacco Guano	8.00	1.65	2.00
Special 9-3-2 Guano.....	9.00	2.47	2.00
Pacific Tobacco and Cotton Grower.....	9.00	2.26	2.00
Rhamkatte Special Tobacco Guano.....	8.00	3.29	6.00
Caraleigh Meal and Tankage Mixture.....	8.00	3.29	4.00
Special 8-4-4	8.00	3.29	4.00
Horne's Best	8.00	2.47	3.00
Eclipse Ammoniated Guano	8.00	2.47	3.00
Caraleigh Formula for Tobacco.....	8.00	2.47	3.00
Planter's Pride	8.00	2.06	3.00
Caraleigh Special Tobacco Guano.....	8.00	2.06	3.00
Eli Ammoniated Fertilizer	8.00	1.65	2.00
Crown Ammoniated Guano	8.00	1.65	2.00
16 Per Cent Acid Phosphate.....	16.00	....	....
Climax Dissolved Bone	14.00	....	....
Sterling Acid Phosphate	13.00	....	....
Staple Acid Phosphate	12.00	....	....
Horne & Sons High Grade Bone and Potash.....	11.00	....	5.00

*Name of Brand**Available
Phos. Acid
Per Cent**Nitrogen
Per Cent**Potash
Per Cent*

Special Bone and Potash Mixture.....	10.00	....	4.00
Morris & Scarboro's Special Bone and Potash.....	10.00	....	3.00
Buncombe Corn Grower	8.00	....	4.00
Buncombe Wheat Grower	8.00	....	4.00
Electric Bone and Potash.....	10.00	....	2.00
Raw Bone Meal	20.00	3.70	....

CAROLINA UNION FERTILIZER COMPANY,

NORFOLK, VA.

*Name of Brand**Available
Phos. Acid
Per Cent**Nitrogen
Per Cent**Potash
Per Cent*

Carolina Union 3-8-3	8.00	2.46	3.00
Carolina Union 3-8-2	8.00	2.46	2.00
Carolina Union 3-8-1	8.00	2.46	1.00
Carolina Union 4-10	10.00	3.29	....
Carolina Union 4-8	8.00	3.29	....
Carolina Union 4-6	6.00	3.29	....
Carolina Union 3-12	12.00	2.46	....
Carolina Union 3-10	10.00	2.46	....
Carolina Union 3-9	9.00	2.46	....
Carolina Union 16	16.00	....	....
Carolina Union 14	14.00	....	....
Fish Guano	10.00	8.20	....
Nitrate of Soda.....	....	14.00	....

CATAWBA FERTILIZER COMPANY,

LANCASTER, S. C.

*Name of Brand**Available
Phos. Acid
Per Cent**Nitrogen
Per Cent**Potash
Per Cent*

Catawba Red Star	8.00	2.47	3.00
Catawba Eclipse	8.00	1.65	2.00
Catawba Ammoniated Compound	10.00	3.30	....
Catawba Ammoniated Compound	8.00	3.30	....
Catawba Ammoniated Compound	9.00	2.47	....
Catawba Ammoniated Compound	10.00	1.65	....
Catawba Acid and Potash	10.00	....	2.00
Catawba Acid Phosphate (H. G.).....	16.00	....	....

THE CHESAPEAKE CHEMICAL COMPANY,

BALTIMORE, MD.

*Name of Brand**Available
Phos. Acid
Per Cent**Nitrogen
Per Cent**Potash
Per Cent*

C. C. & Co.'s 4-8-6 Fertilizer.....	8.00	3.28	....
C. C. & Co.'s 4-6-0 Fertilizer.....	6.00	3.28	....
C. C. & Co.'s Favorite Producer.....	10.00	2.46	....
C. C. & Co.'s 3-9-0 Fertilizer.....	9.00	2.46	....
C. C. & Co.'s Fish Tobacco Guano	8.00	2.46	3.00
C. C. & Co.'s Fish Tobacco Guano, Revised.....	8.00	2.46	2.00
C. C. & Co.'s 3-8-1 Fertilizer.....	8.00	2.46	1.00
C. C. & Co.'s General Crop Grower	9.00	2.25	2.00
C. C. & Co.'s 2-9-2 Fertilizer.....	9.00	1.64	2.00
C. C. & Co.'s National Crop Grower.....	8.00	1.64	2.00
C. C. & Co.'s Dissolved Phosphate	16.00	....	....
C. C. & Co.'s 4-6-1 Fertilizer.....	6.00	3.28	1.00

CHICKAMAUGA FERTILIZER WORKS,
CHATTANOOGA, TENN.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Chickamauga High Grade Fertilizer.....	10.00	1.65	2.00
Georgia Home Guano.....	8.00	1.65	2.00
Chickamauga Blood-Meal Compound	10.00	1.65	1.00
Chickamauga Blood-Meal Compound No. 921.....	9.00	1.65	1.00
Chickamauga Blood, Bone and Tankage Guano.....	9.00	.82	2.00
Chickamauga Soluble Bone	10.00	.82	1.00
Chickamauga Special Formula No. 1220.....	12.00	1.65	....
Chickamauga Special Formula No. 1020.....	10.00	1.65	....
Chickamauga H. G. Dissolved Bone No. 16.....	16.00	....	....
Chickamanga H. G. Dissolved Bone.....	14.00	....	....
Chickamauga Dissolved Bone	12.00	....	....
Nitrate of Soda.....	....	15.00	....

CHOWAN COTTON OIL AND FERTILIZER COMPANY,
EDENTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Chowan Special	12.00	1.65	....
Chowan Special	12.00	2.475	....
Chowan Special	12.00	3.30	....
Chowan Special	10.00	1.65	....
Chowan Special	10.00	2.475	....
Chowan Special	10.00	3.20	....
Chowan Special	9.00	2.475	....
Chowan Special	9.00	3.30	....
Chowan Special	9.25	2.8875	....
Chowan Special	9.00	4.125	....
Chowan Special	8.00	3.30	....
Chowan Special	8.00	4.125	....
Chowan Special	6.00	5.775	....
Chowan Special	6.00	5.15	....
Chowan Special	7.00	4.125	....
Chowan Special .....	....	8.25	....
Nitrate of Soda.....	....	14.25	....
Acid Phosphate	16.00	....	....

COE MORTIMER COMPANY,
CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Coe Mortimer Company's 10-2-0.....	10.00	1.65	....
Coe Mortimer Company's 12-2-0.....	12.00	1.65	....
Coe Mortimer Company's 12-3-0.....	12.00	2.47	....
Coe Mortimer Company's 10-3-0.....	10.00	2.47	....
Coe Mortimer Company's 9-3-0.....	9.00	2.47	....
Mortimer's Meal Mixture D-9-3-0.....	9.00	2.47	....
Coe Mortimer Company's Fish Mixture D-9-3-0.....	9.00	2.47	....
Mortimer's Meal Mixture A-8-4-0.....	8.00	3.29	....
Coe Mortimer Company's Fish Mixture A-8-4-0.....	8.00	3.29	....
Coe Mortimer Company's 10-4-0.....	10.00	3.29	....
Coe Mortimer Company's 8-4-0.....	8.00	3.29	....
Coe Mortimer Company's 6-4-0.....	6.00	3.29	....
Coe Mortimer Company's 10-5-0.....	10.00	4.11	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Coe Mortimer Company's 8-5-0.....	8.00	4.11	....
Coe Mortimer Company's 8-7-0.....	8.00	5.76	....
Coe Mortimer Company's 7-8-0.....	7.00	6.58	....
Coe Mortimer Company's 5-10-0.....	5.00	8.23	....
Coe Mortimer Company's 10-1-1.....	10.00	.82	1.00
Coe Mortimer Company's 10-2-1.....	10.00	1.65	1.00
Coe Mortimer Company's 9-2-1.....	9.00	1.65	1.00
Coe Mortimer Company's 10-2½-1.....	10.00	2.06	1.00
Coe Mortimer Company's 9-3-1.....	9.00	2.47	1.00
Coe Mortimer Company's 8-3-1.....	8.00	2.47	1.00
Coe Mortimer Company's 8-4-1.....	8.00	3.29	1.00
Coe Mortimer Company's 10-5-1.....	10.00	4.11	1.00
Coe Mortimer Company's 7-5-1.....	7.00	4.11	1.00
Coe Mortimer Company's 6-7-1.....	6.00	5.76	1.00
Coe Mortimer Company's 5-7-1.....	5.00	5.76	1.00
Coe Mortimer Company's 5-10-1.....	5.00	8.23	1.00
Coe Mortimer Company's Dissolved Bone.....	16.00	....	....
Coe Mortimer Company's Dissolved Bone.....	14.00	....	....
Nitrate of Soda 18 per cent.....	....	14.83	....
Dried Blood .....	....	13.16	....

COLUMBIA GUANO COMPANY,

NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Columbia High Grade 16 per cent Acid Phosphate.....	16.00	....	....
Columbia 14 per cent Acid Phosphate.....	14.00	....	....
Columbia Dissolved Bone	13.00	....	....
Columbia Sickle Ammoniated Phosphate.....	12.00	1.65	....
Columbia 12 and 6 Bone and Potash Mixture.....	12.00	....	6.00
Columbia 12 and 5 Bone and Potash Mixture.....	12.00	....	5.00
Columbia 12 and 2 Bone and Potash Mixture.....	12.00	....	2.00
Columbia Acid Phosphate	12.00	....	....
Columbia Milestone Ammoniated Phosphate.....	11.00	2.47	....
Columbia 11 and 5 Bone and Potash Mixture.....	11.00	....	5.00
Columbia 11 and 1 Bone and Potash Mixture.....	11.00	....	1.00
Columbia 10½ and 1½ Bone and Potash Mixture.....	10.50	....	1.50
Columbia Elmo Special Truck Compound.....	10.00	4.94	....
Columbia Ammonia Phosphate Mixture.....	10.00	3.30	....
Columbia Ore Meal Mixture.....	10.00	2.47	1.00
Columbia Orbit Fertilizer	10.00	2.47	1.00
Columbia Pick Ax Ammoniated Phosphate.....	10.00	2.47	....
Columbia Duplex Ammoniated Phosphate.....	10.00	1.65	....
Columbia Hazelwood Special	10.00	.82	3.00
Columbia Old Glory Fertilizer.....	10.00	.82	1.00
Columbia 10 and 5 Bone and Potash Mixture.....	10.00	....	5.00
Columbia 10 and 4 Bone and Potash Mixture.....	10.00	....	4.00
Columbia Bone and Potash Mixture for Grain.....	10.00	....	3.00
Columbia Bone and Potash Mixture.....	10.00	....	2.00
Columbia Congress Ammoniated Phosphate.....	9.00	2.47	....
Columbia Argo Tobacco Fertilizer.....	9.00	2.26	2.00
Columbia C. S. M. Special.....	9.00	2.26	2.00
Columbia Titanic Meal Mixture.....	9.00	2.26	1.00
Columbia Roanoke Ammoniated Guano.....	9.00	1.65	3.00
Columbia Carolina Soluble Guano.....	9.00	1.65	1.00
Columbia Grain Guano	9.00	.82	3.00
Columbia Special 9-1-2- Guano.....	9.00	.82	2.00
Columbia Saki 7 per cent Ammoniated Phosphate.....	8.00	5.76	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Columbia Aztec Sweet Potato Guano.....	8.00	4.12	3.00
Columbia Trumpet Truck Compound.....	8.00	4.12	1.00
Columbia Ambrosia Ammoniated Phosphate.....	8.00	4.12	....
Columbia Tobacco King	8.00	3.30	5.00
Columbia Steamboat Ammoniated Guano.....	8.00	3.30	4.00
Columbia Hornpipe Truck Guano.....	8.00	3.30	4.00
Columbia Trojan Tobacco Guano.....	8.00	3.30	4.00
Columbia Pendulum Special Fertilizer.....	8.00	3.30	3.00
Columbia Roundup Guano	8.00	3.30	2.00
Columbia Aurora Fertilizer	8.00	3.30	1.00
Columbia Big Dipper Ammoniated Phosphate.....	8.00	3.30	....
Columbia Picnic Tobacco Guano.....	8.00	2.88	5.00
Columbia Happy Thought Tobacco Guano.....	8.00	2.47	7.00
Columbia Yelverton Bros. Plant Food for Tobacco.....	8.00	2.47	5.00
Columbia Jubilee High Grade Guano.....	8.00	2.47	4.00
Columbia Special Sweet Potato Guano.....	8.00	2.47	3.00
Columbia Falcon Cotton Guano.....	8.00	2.47	3.00
Columbia Hyco Tobacco Guano.....	8.00	2.47	3.00
Columbia Tallyho Tobacco Guano.....	8.00	2.47	2.00
Columbia Zolo Tobacco Fertilizer.....	8.00	2.47	1.00
Columbia Optimo Fertilizer	8.00	2.47	1.00
Columbia Spruce Brand Meal Mixture.....	8.00	2.47	1.00
Columbia Bulldog Cotton Grower.....	8.00	2.06	3.00
Columbia Torpedo Tobacco Guano.....	8.00	2.06	3.00
Columbia Special Tobacco Guano.....	8.00	2.06	2.00
Columbia Pathfinder Tobacco Fertilizer.....	8.00	1.65	5.00
Columbia Avolyn Cotton Guano.....	8.00	1.65	4.00
Columbia Fish, Phosphate and Potash.....	8.00	1.65	3.00
Columbia Special Wheat Fertilizer.....	8.00	1.65	2.00
Columbia Soluble Guano.....	8.00	1.65	2.00
Columbia Soluble for Tobacco.....	8.00	1.65	2.00
Columbia Spinola Peanut Grower.....	8.00	1.03	4.00
Columbia 8 and 4 Bone and Potash Mixture.....	8.00	....	4.00
Columbia Special 7 per cent Truck Guano.....	7.00	5.76	7.00
Columbia Silver Bow Ammoniated Phosphate.....	7.00	4.94	....
Columbia Potato Manure.....	7.00	4.12	7.00
Columbia Potato Guano	7.00	4.12	5.00
Columbia Gray Goose Truck Grower.....	7.00	4.12	3.00
Columbia Pointer 5 per cent Potato Guano.....	7.00	4.12	1.00
Columbia 5 per cent Ammoniated Phosphate.....	7.00	4.12	....
Columbia Rapidan Special Formula.....	7.00	1.65	5.00
Columbia Bandanna Peanut Fertilizer.....	7.00	....	5.00
Columbia Special 10 per cent Truck Compound.....	6.00	8.23	....
Columbia 7 per cent Potato Grower.....	6.00	5.76	5.00
Columbia Ozark 7 per cent Truck Compound.....	6.00	5.76	2.00
Columbia Southland 7 per cent Potato Guano.....	6.00	5.76	1.00
Columbia 7 per cent Ammoniated Phosphate.....	6.00	5.76	....
Columbia Irish Potato Grower.....	6.00	4.12	7.00
Columbia Shamrock Potato Guano.....	6.00	4.12	5.00
Columbia Magnet Truck Guano.....	6.00	4.12	1.00
Columbia Goblin Ammoniated Phosphate.....	6.00	4.12	....
Columbia Early Sweet Potato Grower.....	6.00	3.30	5.00
Columbia Battery Ammoniated Phosphate.....	6.00	3.30	....
Columbia 10 per cent Truck Guano.....	5.00	8.23	3.00
Columbia Cabbage Guano	5.00	8.23	2.50
Columbia Savoy 10 per cent Truck Compound.....	5.00	8.23	....
Columbia Clipper Truck Grower.....	5.00	5.76	5.00
Columbia Ventura Potato Producer.....	5.00	4.94	7.00
Columbia Side Dresser	4.00	8.23	4.00
Columbia Fourteno Top Dresser.....	4.00	8.23	....
Columbia Special Top Dresser.....	4.00	6.17	2.50

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Columbia Threenineo Top Dresser.....	3.00	7.40	....
Columbia Top Dresser .....	....	7.40	3.00
Columbia Pure Raw Bone Meal (Total).....	21.50	3.70	....
Nitrate of Soda.....	....	15.21	....
Columbia Cotton Seed Meal.....	....	6.17	....
Columbia Outlook Truck Compound.....	6.00	5.76	3.00

CONESTEE CHEMICAL COMPANY,
ACME, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Conestee 4-10-0 Top Dresser.....	4.00	8.25	....
Conestee 3-9-0 Top Dresser.....	3.00	7.40	....
Conestee 12-4-0 Fertilizer	12.00	3.30	....
Conestee 12-4-0 Special Fertilizer	12.00	3.30	....
Conestee 12-3-0 Fertilizer	12.00	2.47	....
Conestee 12-3-0 Special Fertilizer	12.00	2.47	....
Conestee 12-2-0 Fertilizer	12.00	1.65	....
Conestee 12-2-0 Special Fertilizer.....	12.00	1.65	....
Conestee 10-4-0 Fertilizer	10.00	3.30	....
Conestee 10-4-0 Special Fertilizer.....	10.00	3.30	....
Conestee 10-3-0 Fertilizer	10.00	2.47	....
Conestee 10-3-0 Special Fertilizer.....	10.00	2.47	....
Conestee 10-2-0 Fertilizer	10.00	1.65	....
Conestee 10-2-0 Special Fertilizer.....	10.00	1.65	....
Conestee 9-4-0 Fertilizer	9.00	3.30	....
Conestee 9-4-0 Special Fertilizer.....	9.00	3.30	....
Conestee 9-3-0 Fertilizer	9.00	2.47	....
Conestee 9-3-0 Special Fertilizer.....	9.00	2.47	....
Conestee 8-4-0 Fertilizer	8.00	3.30	....
Conestee 8-4-0 Special Fertilizer.....	8.00	3.30	....
Conestee 7-5-0 Fertilizer	7.00	4.12	....
Conestee 7-5-0-Special Fertilizer	7.00	4.12	....
Conestee 6-5-0 Fertilizer	6.00	4.12	....
Conestee 6-5-0 Special Fertilizer.....	6.00	4.12	....
Conestee 6-4-0 Fertilizer.....	6.00	3.30	....
Conestee 6-4-0 Special Fertilizer	6.00	3.30	....
16 per cent Acid Phosphate.....	16.00	....	....
Sulphate of Ammonia.....	....	20.56	....
Nitrate of Soda.....	....	14.81	....
Fish Scrap	4.00	8.22	....
Dried Ground Blood.....	....	11.51	....
Cotton Seed Meal.....	....	6.17	....

CONTENTNEA GUANO COMPANY,
WILSON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Climax Special	8.00	3.30	....
Special Cotton Grower.....	9.00	2.47	....
Contentnea Tobacco Grower.....	8.00	2.47	1.00
Matchless Tobacco Grower.....	8.00	2.47	1.00
High Grade Tobacco Grower.....	8.00	2.47	2.00
High Grade 16 per cent Acid.....	16.00	....	....
Nitrate of Soda.....	....	15.25	....

CO-OPERATIVE WAREHOUSE COMPANY,

SALISBURY, N. C.

<i>Name of Brand</i>			<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Farmers Union	12-4-4	Guano.....	12.00	3.29	4.00
Farmers Union	12-2-4	Guano.....	12.00	1.65	4.00
Farmers Union	10-4-4	Guano.....	10.00	3.29	4.00
Farmers Union	10-3-3	Guano.....	10.00	2.47	3.00
Farmers Union	10-2-2	Guano.....	10.00	1.65	2.00
Farmers Union	10-1 1/4-6	Guano.....	10.00	1.03	6.00
Farmers Union	10-1 1/4-4	Guano.....	10.00	1.03	4.00
Farmers Union	9-3-6	Guano.....	9.00	2.47	6.00
Farmers Union	9-3-4	Guano.....	9.00	2.47	4.00
Farmers Union	9-3-3	Guano.....	9.00	2.47	3.00
Farmers Union	9-2 3/4-2	Guano.....	9.00	2.26	2.00
Farmers Union	9-2 1/4-4	Guano.....	9.00	1.85	4.00
Farmers Union	9-2-3	Guano.....	9.00	1.65	3.00
Farmers Union	9-1-3	Guano.....	9.00	.82	3.00
Farmers Union	9-1-2	Guano.....	9.00	.82	2.00
Farmers Union	9-2-1	Guano.....	9.00	1.65	1.00
Farmers Union	9-2 3/4-2	Tobacco Guano.....	9.00	2.26	2.00
Farmers Union	9-3-2	Guano.....	9.00	2.47	2.00
Farmers Union	12-3-1	Guano.....	12.00	2.47	1.00
Farmers Union	11-2-1	Guano.....	11.00	1.65	1.00
Farmers Union	10-1-1	Guano.....	10.00	.82	1.00
Farmers Union	8-4 1/2-7	Guano.....	8.00	3.71	7.00
Farmers Union	8-4 1/2-7	Tobacco Guano.....	8.00	3.71	7.00
Farmers Union	8-4-6	Guano.....	8.00	3.29	6.00
Farmers Union	8-4-6	Tobacco Guano.....	8.00	3.29	6.00
Farmers Union	8-4-4	Guano.....	8.00	3.29	4.00
Farmers Union	8-4-2	Guano.....	8.00	3.29	2.00
Farmers Union	8-3-10	Guano.....	8.00	2.47	10.00
Farmers Union	8-3-7	Guano.....	8.00	2.47	7.00
Farmers Union	8-3-7	Tobacco Guano.....	8.00	2.47	7.00
Farmers Union	8-3-6	Guano.....	8.00	2.47	6.00
Farmers Union	8-3-6	Tobacco Guano.....	8.00	2.47	6.00
Farmers Union	8-3-5	Guano.....	8.00	2.47	5.00
Farmers Union	8-3-5	Tobacco Guano.....	8.00	2.47	5.00
Farmers Union	8-3-4	Guano.....	8.00	2.47	4.00
Farmers Union	8-3-4	Tobacco Guano.....	8.00	2.47	4.00
Farmers Union	8-3-3	Guano.....	8.00	2.47	3.00
Farmers Union	8-3-3	Tobacco Guano.....	8.00	2.47	3.00
Farmers Union	8-3-2	Guano.....	8.00	2.47	2.00
Farmers Union	8-3-1	Guano.....	8.00	2.47	1.00
Farmers Union	8-2 1/2-3	Guano.....	8.00	2.06	3.00
Farmers Union	8-2 1/2-3	Tobacco Guano.....	8.00	2.06	3.00
Farmers Union	8-2 1/2-2	Guano.....	8.00	2.06	2.00
Farmers Union	8-2 1/2-2	Tobacco Guano.....	8.00	2.06	2.00
Farmers Union	8-2-10	Guano.....	8.00	1.65	10.00
Farmers Union	8-2-5	Guano.....	8.00	1.65	5.00
Farmers Union	8-2-5	Tobacco Guano.....	8.00	1.65	5.00
Farmers Union	8-2-3	Guano.....	8.00	1.65	3.00
Farmers Union	8-2-3	Tobacco Guano.....	8.00	1.65	2.00
Farmers Union	8-2-2	Guano.....	8.00	1.65	2.00
Farmers Union	8-2-2	Tobacco Guano.....	8.00	1.65	2.00
Farmers Union	8-1-4	Guano.....	8.00	.82	4.00
Farmers Union	8-1-3	Guano.....	8.00	.82	3.00
Farmers Union	7-7-7	Guano.....	7.00	5.76	7.00
Farmers Union	7-5-8	Guano.....	7.00	4.12	8.00
Farmers Union	7-5-5	Guano.....	7.00	4.12	5.00
Farmers Union	7-4-5	Guano.....	7.00	3.29	5.00
Farmers Union	6-6-6	Guano.....	6.00	4.94	6.00
Farmers Union	6-4-7	Guano.....	6.00	3.29	7.00

<i>Name of Brand</i>		<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Farmers Union 4-4 6 Guano.....		4.00	3.29	6.00
Farmers Union 4-7 ½-2 Top Dresser.....		4.00	6.17	2.00
Farmers Union 0-9-3 Top Dresser.....		....	7.40	3.00
Farmers Union 10-4 Ammo. Compound.....		10.00	3.29	....
Farmers Union 10-3 Ammo. Compound.....		10.00	2.47	....
Farmers Union 10-2 Ammo. Compound.....		10.00	1.65	....
Farmers Union 12-2 Ammo. Compound.....		12.00	1.65	....
Farmers Union 6-4 Ammo. Compound		6.00	3.29	....
Farmers Union 14-2 Bone and Potash.....		14.00	....	2.00
Farmers Union 14-1 Bone and Potash.....		14.00	....	1.00
Farmers Union 12-6 Bone and Potash.....		12.00	....	6.00
Farmers Union 12-5 Bone and Potash.....		12.00	....	5.00
Farmers Union 12-4 Bone and Potash.....		12.00	....	4.00
Farmers Union 12-3 Bone and Potash.....		12.00	....	3.00
Farmers Union 12-2 Bone and Potash.....		12.00	....	2.00
Farmers Union 11-5 Bone and Potash.....		11.00	....	5.00
Farmers Union 11-2 Bone and Potash.....		11.00	....	2.00
Farmers Union 11-1 Bone and Potash.....		11.00	....	1.00
Farmers Union 10 ½-1 ½ Bone and Potash.....		10 ½	....	1 ½
Farmers Union 10-6 Bone and Potash.....		10.00	....	6.00
Farmers Union 10-5 Bone and Potash.....		10.00	....	5.00
Farmers Union 10-4 Bone and Potash.....		10.00	....	4.00
Farmers Union 10-3 Bone and Potash.....		10.00	....	3.00
Farmers Union 10-2 Bone and Potash.....		10.00	....	2.00
Farmers Union 8-5 Bone and Potash.....		8.00	....	5.00
Farmers Union 8-4 Bone and Potash.....		8.00	....	4.00
Farmers Union 20-12 Bone and Potash.....		20.00	....	12.00
Farmers Union 20-8 Bone and Potash.....		20.00	....	8.00
Farmers Union 16 per cent Acid Phosphate.....		16.00	....	....
Farmers Union 14 per cent Acid Phosphate.....		14.00	....	....
Farmers Union 13 per cent Acid Phosphate.....		13.00	....	....
Farmers Union 12 per cent Acid Phosphate.....		12.00	....	....
Farmers Union 24 per cent Acid Phosphate.....		24.00	....	....
Farmers Union 21.5-4.5 Bone Meal.....		21.5	3.70	....
Farmers Union 12 per cent Kainit.....		....	....	12.00
Farmers Union Nitrate of Soda.....		....	15.00	....
Farmers Union Muriate of Potash.....		....	....	48.00
Farmers Union Sulphate of Potash.....		....	....	48.00
Farmers Union 10 per cent Fish Scrap.....		....	8.24	....
Farmers Union Thos. Phos. (Anchor Brand), 17 to 19 per cent total.				
Farmers Union Ground Phosphate Rock, 28 per cent total.				
Farmers Union Tankage	2.00			....
Farmers Union Dried Blood.....	....		13.00	....
Farmers Union Dissolved Animal Bone.....	13.00		2.06	....
Farmers Union 7 ½ Cotton Seed Meal.....	....		6.17	....

COWETA FERTILIZER COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>		<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Coweta Perfection Tobacco Grower.....		8.00	2.47	3.00
Seabird Standard Guano.....		8.00	2.47	3.00
Coweta Animal Bone, Revised.....		8.00	3.29	1.00
Coweta Standard Guano		8.00	2.47	2.00
Coweta Royal Guano		8.5	2.06	1.00
Coweta Success Guano		8.00	1.65	2.00
Coweta Mascot Tobacco Guano, Revised, 1917.....		9.00	1.65	1.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Coweta Fish Guano, Revised.....	10.00	1.65	1.00
Coweta 14 and 2 Ammoniated Compound.....	14.00	1.65	....
Coweta 12 and 2 Ammoniated Compound.....	12.00	1.65	....
Coweta 10 and 2 Ammoniated Compound.....	10.00	1.65	....
Coweta 9 and 3 Ammoniated Compound.....	9.00	2.47	....
Coweta 9 and 4 Ammoniated Compound.....	9.00	3.29	....
Coweta 10 and 4 Ammoniated Compound.....	10.00	3.29	....
Coweta 6 and 7 Ammoniated Compound.....	6.00	5.76	....
Coweta 16 per cent Acid Phosphate.....	16.00	....	....
Coweta High Grade Acid Phosphate.....	14.00	....	....
Coweta Acid Phosphate	13.00	....	....
Coweta 8 and 4 Ammoniated Compound.....	8.00	3.29	....
Coweta 6 and 4 Ammoniated Compound.....	6.00	3.29	....

 CRAVEN CHEMICAL COMPANY.

NEW BERN, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
CCC Grain Fertilizer	10.00	.82	1.00
CCC Gem Guano	12.00	1.65	1.00
CCC Special 8-3-1 Guano	8.00	2.47	1.00
CCC Special Fertilizer No. 3.....	10.00	2.47	1.00
CCC Special No. 921	9.00	1.65	1.00
CCC Special Fertilizer No. 2.....	10.00	1.65	1.00
Elite Cotton Guano	8.00	1.65	2.00
CCC Tobacco Guano	8.00	1.65	2.00
CCC Dixie Guano	8.00	1.65	2.00
CCC Proficient C. S. M.....	9.00	2.26	2.00
CCC Special No. 832.....	8.00	2.47	2.00
CCC Truck Guano (Revised).....	5.00	8.23	2.00
CCC Neuse Truck Guano, Revised.....	6.00	4.94	2.00
CCC Pantego Potato Guano (Revised).....	7.00	4.11	2.00
CCC Red Wing Standard Tobacco (Revised).....	9.00	1.65	2.00
CCC Special High Grade.....	10.00	1.65	2.00
CCC Duplin Tobacco (Revised).....	8.00	2.47	2.00
CCC Gaston H. G. Fert. (Revised).....	8.00	2.47	2.00
CCC C. E. Foy's H. G. Guano (Revised).....	8.00	2.47	2.00
CCC Tobacco Special (Revised).....	8.00	2.47	2.00
CCC Hanover Standard (Revised).....	8.00	3.29	2.00
CCC Currituck Sweet Pot. Guano (Revised).....	8.00	4.94	2.00
CCC Top Dresser D.....	....	7.40	2.00
CCC Top Dresser B.....	4.00	6.17	2.50
CCC Truck Guano 5-10-2 1/2.....	5.00	8.23	2.50
Prolix 9-2-3 Special Guano.....	9.00	1.65	3.00
Marvel Great Crop Grower.....	8.00	2.06	3.00
Halifax Guano	9.00	2.47	3.00
Duplin Tobacco Guano.....	8.00	2.47	3.00
Gaston High Grade Fertilizer.....	8.00	2.47	3.00
C. E. Foy's High Grade Guano.....	8.00	2.47	3.00
Dixon Special Tobacco	8.00	2.47	3.00
CCC Tobacco Special	8.00	2.47	3.00
CCC Special Fish and Meal.....	8.00	2.47	3.00
CCC Top Dresser C.....	....	7.40	3.00
CCC Peanut Grower	8.00	.82	4.00
Selma Special Guano.....	9.00	1.85	4.00
Hanover Standard Guano.....	8.00	3.29	4.00
CCC Top Dresser A.....	4.00	8.23	4.00
Red Wing Standard Tobacco Guano.....	8.00	2.47	5.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Currituck Sweet Potato Guano.....	8.00	2.47	6.00
CCC Standard Tobacco Guano.....	8.00	2.47	6.00
Neuse Truck Grower.....	6.00	4.94	6.00
Japan Tobacco Guano.....	6.00	3.29	7.00
Pantego Potato Guano.....	7.00	4.11	7.00
Trent Bone and Potash.....	10.00	....	2.00
CCC Wheat Grower	8.00	....	4.00
Craven Grain Compound	10.00	....	4.00
Craven High Grade Bone and Potash.....	12.00	....	4.00
Herring Bone and Potash.....	12.00	....	5.00
Foy's High Grade Bone and Potash Mixture.....	10.00	....	6.00
Turkey Trot Bone and Potash.....	12.00	....	6.00
CCC Ammoniated Comp. No. 510.....	5.00	8.23	....
CCC Ammoniated Comp. No. 850.....	8.00	4.11	....
CCC Ammoniated Comp. No. 640.....	6.00	3.29	....
CCC Ammoniated Comp. No. 840.....	8.00	3.29	....
CCC Ammoniated Comp. No. 940.....	9.00	3.29	....
CCC Ammoniated Comp. No. 104.....	10.00	3.29	....
CCC Ammoniated Comp. No. 930.....	9.00	2.47	....
CCC Ammoniated Comp. No. 103.....	10.00	2.47	....
CCC Ammoniated Comp. No. 102.....	10.00	1.65	....
CCC Ammoniated Comp. No. 122.....	12.00	1.65	....
CCC 12 per cent Acid Phosphate.....	12.00	....	....
CCC 13 per cent Acid Phosphate.....	13.00	....	....
Jewell Acid Phosphate.....	14.00	....	....
Panama Acid Phosphate.....	16.00	....	....
Nitrate of Soda.....	....	14.81	....
Nitrate of Soda.....	....	14.81	....
Fish Scrap .....	....	8.23	....
CCC Pantego Potato Guano, Revised, No. 3.....	7.00	4.11	3.00
CCC Empire Guano	8.00	2.47	2.00
CCC Carolina Guano	8.00	1.65	2.00
CCC Ammoniated Comp. No. 660.....	6.00	4.94	....
CCC Special No. 834.....	8.00	2.47	4.00
CCC Hanover Standard, Revised, No. 3.....	8.00	3.29	3.00
CCC Fish Compound	9.00	2.47	....
CCC Ammoniated Comp. No. 750.....	7.00	4.11	....

CENTRAL PHOSPHATE COMPANY,
MOUNT PLEASANT, TENN.

<i>Name of Brand</i>	<i>Insoluble Phosphate Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Tennessee Phosphate	29.34	....	....

DIXIE GUANO COMPANY, INC.,
SUFFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Dixie 10 per cent Top Dresser (Revised).....	5.00	8.23	....
Dixie 3 and 10 Guano.....	10.00	2.47	....
Dixie Fine Ground Bone Meal.....	22.00	2.47	....
Dixie Acid Phosphate.....	16.00	....	....
Nitrate of Soda.....	....	15.00	....
Ground Fish .....	....	8.22	....
Dixie 4 and 8 Guano.....	8.00	3.29	...

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Dixie 2 and 10 Guano.....	10.00	1.65	....
Dixie Cotton Seed Meal Mixture.....	10.00	2.47	1.00
Dixie 7 per cent Potato (Guano (Revised).....	8.00	5.75	....
Animal Tankage	5.00	5.80	....
Dixie 7 and 5 Guano.....	5.00	5.75	....
Dixie Tobacco Guano.....	8.00	2.47	2.00
Ground Tobacco Stems.....	....	1.65	6.00
Sulphate of Ammonia.....	....	20.50	....

EASTERN COTTON OIL COMPANY,

HERTFORD, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Hertford Truck Grower Substitute.....	6.00	5.77	1.00
Substitute for Nun-Such.....	6.00	4.12	1.00
Mat Whites Special for Corn and Cotton.....	8.00	3.29	1.00
Farmers Sensation for Tobacco.....	8.00	2.47	3.00
Rainproof Substitute	8.00	2.47	.50
Half and Half Cotton Seed Meal and Acid Phosphate.....	9.00	2.46	.75
Winslow's Special	6.00	3.29	....
Acid Phosphate	16.00	....	....
Fish Scrap .....	....	8.90	....
Nitrate of Soda.....	....	15.67	....
Our Surprise	8.00	4.12	....
Fish Scrap .....	....	8.20	....

ETIWAN FERTILIZER COMPANY,

CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Etiwan 16 per cent Acid Phosphate.....	16.00	....	....
Etiwan H. G. Acid Phosphate.....	14.00	....	....
Etiwan Dissolved Bone.....	13.00	....	....
Etiwan Acid Phos. with Potash.....	11.00	....	1.00
Etiwan Potash Bone.....	10.00	....	4.00
Etiwan Soluble Bone with Potash.....	10.00	....	3.00
XX Acid Phos. with Potash.....	10.00	....	2.00
Etiwan Blood and Bone Guano.....	9.00	2.06	1.00
Etiwan Superior Cotton Fertilizer.....	8.00	3.30	6.00
Etiwan Special Cotton Fertilizer.....	8.00	3.30	4.00
Etiwan Cotton Compound.....	8.00	2.47	3.00
Etiwan H. G. Cotton Fertilizer.....	8.00	2.47	2.00
Etiwan Ammoniated Fertilizer.....	8.00	1.65	2.00
Etiwan Special Potash Mixture.....	8.00	....	4.00
Etiwan Ammoniated Mixture.....	8.00	4.00	....
Etiwan Ammoniated Mixture.....	9.00	3.00	....
Etiwan Ammoniated Mixture.....	9.00	4.00	....
Etiwan Ammoniated Mixture.....	10.00	3.00	....
Etiwan Ammoniated Mixture.....	10.00	4.00	....
Plow Brand 16 per cent Acid Phosphate.....	16.00	....	....
Plow Brand H. G. Acid Phosphate.....	14.00	....	....
Diamond Soluble Bone.....	13.00	....	....
Plow Brand Acid Phos. with Potash.....	11.00	....	1.00
Diamond Soluble Bone with Potash.....	10.00	....	2.00
Plow Brand Raw Bone Superphosphate.....	9.00	2.06	1.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Plow Brand Superior Cotton Fertilizer.....	8.00	3.30	6.00
Plow Brand Special Cotton Fertilizer.....	8.00	3.30	4.00
Plow Brand Cotton Compound.....	8.00	2.47	3.00
Plow Brand H. G. Cotton Fertilizer.....	8.00	2.47	2.00
Plow Brand Ammoniated Fertilizer.....	8.00	1.65	2.00
Plow Brand Special Potash Mixture.....	8.00	....	4.00
Plow Brand Ammoniated Mixture.....	8.00	4.00	....
Plow Brand Ammoniated Mixture.....	9.00	3.00	....
Plow Brand Ammoniated Mixture.....	9.00	4.00	....
Plow Brand Ammoniated Mixture.....	10.00	3.00	....
Plow Brand Ammoniated Mixture.....	10.00	4.00	....
Nitrate of Soda.....	....	14.82	....

FARMERS' COTTON OIL COMPANY,
WILSON, N. C.,

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Planter's Friend Guano	8.00	3.30	2.00
Crop King Guano	8.00	2.88	2.00
Farmer's Special Guano	8.00	2.47	2.00
16 Per Cent Acid Phosphate.....	16.00	....	....
Bonnum Acid Phosphate	14.00	....	....
Washington's Corn Mixture	10.00	1.65	5.00
Xtra Good Bone and Potash.....	10.00	....	2.00
Whitley's Special Guano	9.00	3.30	4.00
Dean's Special Guano	8.00	3.50	7.00
Regal Tobacco Guano	8.00	2.88	5.00
Newsome Tobacco Special	8.00	2.47	4.00
Graves' Cotton Grower Guano.....	8.00	2.47	3.00
Golden Gem Guano	8.00	2.47	3.00
Wilson High Grade Guano.....	8.00	3.30	1.00
Carolina Choice Guano	8.00	3.30	½
Perfect Top Dresser	2.00	8.23	2.00
Sulphate of Ammonia .....	....	20.57	....
Nitrate of Soda .....	....	15.63	....
Nitrate Special .....	....	10.66	4.00
Tomlinson's Nitrate Special .....	....	9.87	2.00
B. B. Special	8.00	2.88	8.00
Nitro Gem .....	....	9.87	....
Special Guano	8.00	5.76	....
F. C. O. Co.'s Cotton Seed Meal Mixture.....	8.00	2.47	1.00

FARMER'S GUANO COMPANY,
NORFOLK, VA., RALEIGH, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Farmer's Bull	12.00	1.65	....
14-1 Ammoniated Phosphate	14.00	.82	....
12-2 Ammoniated Phosphate	12.00	1.65	....
10-4 Ammoniated Phosphate	10.00	3.29	....
10-2 Ammoniated Phosphate	10.00	1.65	....
9-3 Ammoniated Phosphate	9.00	2.47	....
8-4 Ammoniated Phosphate	8.00	3.29	....
8-3 ¼ Ammoniated Phosphate	8.00	2.67	....
7-4 Ammoniated Phosphate	7.00	3.29	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
6-5 Ammoniated Phosphate	6.00	4.11	....
6-4 Ammoniated Phosphate	6.00	3.29	....
5-5 Ammoniated Phosphate	5.00	4.11	....
4-6 Ammoniated Phosphate	4.00	4.93	....
Farmer's 9-3-1 Guano	9.00	2.47	1.00
Farmer's 10-4-1 Guano	10.00	3.29	1.00
Farmer's 8-3-1 Guano	8.00	2.47	1.00
Farmer's 6-5-1 Guano	6.00	4.11	1.00
Farmer's 8-3-2 Guano	8.00	2.47	2.00
Farmer's Top Dresser	3.00	8.23	4.00
Farmer's 7-7-7 Trucker	7.00	5.76	7.00
Farmer's 6-7-5 Trucker	6.00	5.76	5.00
Farmer's Challenge	7.00	4.11	5.00
Farmer's Blood and Bone	8.00	3.29	4.00
Big Crop Guano for Tobacco.....	8.00	2.88	5.00
Money Point Guano	8.00	2.47	3.00
Farmer's Formula for Tobacco.....	8.00	2.47	3.00
Golden Grade Guano	8.00	2.47	3.00
Toco Tobacco Guano	8.00	2.06	3.00
State Standard Guano	8.00	1.65	2.00
Farmer's Peanut Guano	8.00	1.03	4.00
Farmer's Grain Grower	10.00	1.03	2.00
Farmer's 6-7-1 Trucker	6.00	5.76	1.00
Farmer's 8-5-1 Trucker	8.00	4.11	1.00
Century Bone and Potash.....	10.00	....	2.00
16 Per Cent Acid Phosphite.....	16.00	....	....
14 Per Cent Acid Phosphate.....	14.00	....	....
Farmer's Acid Phosphate	13.00	....	....
Nitrate of Soda .....	....	15.65	....
Kanona Tankage .....	....	9.04	....
Ground Fish .....	....	8.22	....
Farmer's 3-10-0 Top Dresser.....	3.00	8.23	....
8-5 Ammoniated Phosphate	8.00	4.11	....
Farmer's 8-5-3 Guano	8.00	4.11	3.00
6-7 Ammoniated Phosphate	6.00	5.76	....
8-6 Ammoniated Phosphate	8.00	4.93	....

FARMVILLE OIL AND FERTILIZER COMPANY,
FARMVILLE, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
8-3-2 High Grade Tobacco Grower	8.00	2.47	2.00
8-3-2 Fish and Meal Special.....	8.00	2.47	2.00
8-4-2 Tobacco Special	8.00	3.30	2.00
8-3-3 Potash Special	8.00	2.47	3.00
8-4-½ Special Formula for Cotton.....	8.00	3.30	½
8-4-½ Tobacco Guano	8.00	3.30	½
8-3-1 Tobacco Grower	8.00	2.47	1.00
8-3-1 Cotton Grower	8.00	2.47	1.00
8-4-1 Tobacco Grower	8.00	3.30	1.00
9-3-0 Cotton and Corn Guano.....	9.00	2.47	....
9-3-1 Tobacco Grower	9.00	2.47	1.00
8-2-2 Tobacco Grower	8.00	1.65	2.00
16 Per Cent Acid Phosphate.....	16.00	....	....
9-2¾-2 Specific Cotton Grower	9.00	2.25	2.00
Nitrate of Soda .....	....	15.00	....
Ground Fish, 11 Per Cent.....	....	9.00	....
Ground Fish, 10 Per Cent.....	....	8.25	....
Chamblee & Sons Special.....	8.00	2.25	2.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Turnage's Fish Scrap Special 8-3-2.....	8.00	2.47	2.00
Davis' Special Formula 8-4-½.....	8.00	3.30	½
Davis' Tobacco Grower 8-3-2.....	8.00	2.47	2.00

GREENVILLE OIL AND FERTILIZER COMPANY,

(Branch of Farmville Oil and Fertilizer Company),

GREENVILLE, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
G. O. F. Cotton Seed Meal Special.....	8.00	2.47	2.00
8-4-½ Greenville Cotton Grower.....	8.00	3.30	.50
8-4-½ Greenville Tobacco Grower.....	8.00	3.30	.50
8-4-2 Greenville Tobacco Special.....	8.00	3.30	2.00
8-4-1 Special Formula for Tobacco.....	8.00	3.30	1.00
9-3-0 Special Formula for Cotton.....	9.00	2.47	....
9-2¾-2 Special Meal Mixture.....	9.00	2.25	2.00
8-2-2 Carolina Standard.....	8.00	1.65	2.00
16 Per Cent Acid Phosphate.....	16.00	....	....
Nitrate of Soda, 18½ Per Cent.....	....	15.00	....
Ground Fish, 11 Per Cent.....	....	9.00	....
Ground Fish, 10 Per Cent.....	....	8.25	....
8-3-3 Special Formula for Tobacco.....	8.00	2.47	3.00

FEDERAL CHEMICAL COMPANY,

COLUMBIA, TENN.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Tennessee Brown Phosphate Rock, 29¾ Per Cent (Total)....

FREMONT OIL MILL COMPANY,

FREMONT, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
FOMCO C. S. M. Fertilizer.....	9.00	3.70	.75
FOMCO Meal and Fish Fertilizer.....	8.00	4.10	.50
FOMCO 8-3-1 Fertilizer.....	8.00	2.47	1.00
FOMCO 8-3-2 Fertilizer.....	8.00	2.47	2.00
FOMCO 8-3-3 Fertilizer.....	8.00	2.47	3.00
FOMCO 16 Per Cent Acid Phosphate.....	16.00	....	....
FOMCO Nitrate of Soda.....	....	14.82	....
FOMCO Fish Scrap.....	....	8.25	....

FOREIGN PRODUCTS COMPANY, Inc.,

BALTIMORE, Md.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
16 Per Cent Acid Phosphate.....	16.00	....	....
Fish Guano.....	....	8.22	....
Nitrate of Soda.....	....	15.00	....
Fish Scrap.....	....	8.22	....

GEORGIA CHEMICAL WORKS,

AUGUSTA, GA.

(Handled in North Carolina by Union Guano Company, Winston-Salem, N. C.)

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Georgia Tobacco Special	8.00	2.47	3.00
Georgia Tobacco Special, Revised.....	8.00	2.47	2.00

N. G. GRANDY & CO.,

ELIZABETH CITY, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Grandy's 5-8-0 Fertilizer	8.00	4.10	....
Grandy's 5-8-1 Fertilizer	8.00	4.10	1.00
Grandy's 5-8-2 Fertilizer	8.00	4.10	2.00

THE HAMPTON GUANO COMPANY,

NORFOLK, VA.

(Subsidiary of the American Agricultural Chemical Company.)

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Hampton Acid Phosphate	14.00	....	....
Supreme Acid Phosphate	16.00	....	....
Dauntless Potash Mixture	10.00	....	2.00
Extra Tobacco Guano	8.00	1.65	2.00
Alpha Crop Grower	8½	2.06	2½
P. P. P. Princess Prolific Producer.....	8.00	2.47	3.00
Hampton Tobacco Guano	8.00	2.47	3.00
Reliance Truck Guano	7.00	4.11	5.00
Virginia Truck Grower	6.00	5.76	5.00
Hampton 10 Per Cent Truck Grower.....	5.00	8.23	3.00
Excelsior Bone and Potash.....	8.00	....	4.00
Arlington Animal Bone Fertilizer.....	9.00	1.85	4.00
Little's Favorite Crop Grower	8.00	3.29	4.00
Hampton 1-11-0 Fertilizer	11.00	.82	....
Hampton 1-10-1 Fertilizer	10.00	.82	1.00
Hampton 2-10-0 Fertilizer	10.00	1.65	....
Hampton 2-11-0 Fertilizer	11.00	1.65	....
Hampton 2-12-0 Fertilizer	12.00	1.65	....
Hampton 2-9-1 Fertilizer	9.00	1.65	1.00
Hampton 2-10-1 Fertilizer	10.00	1.65	1.00
Hampton Crop Grower	8.00	1.65	2.00
Hampton 2-9-2 Fertilizer	9.00	1.65	2.00
Hampton 2¼-9-1 Fertilizer	9.00	1.85	1.00
Arlington Animal Bone Special.....	9.00	1.85	2.00
Hampton 2½-10-1 Fertilizer	10.00	2.06	1.00
Hampton 3-9-0 Fertilizer	9.00	2.47	....
Hampton 3-8-1 Fertilizer	8.00	2.47	1.00
Hampton 3-8-2 Fertilizer	8.00	2.47	2.00
Hampton Tobacco Special	8.00	2.47	2.00
Hampton 3-9-1 Fertilizer	9.00	2.47	1.00
Hampton 3-9-2 Fertilizer	9.00	2.47	2.00
Hampton 3-10-0 Fertilizer	10.00	2.47	...
Hampton 4-6-0 Fertilizer	6.00	3.29	...

<i>Name of Brand</i>		<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Hampton	4-8-0 Fertilizer	8.00	3.29	....
Hampton	4-8-1 Fertilizer	8.00	3.29	1.00
Hampton	4-8-2 Fertilizer	8.00	3.29	2.00
Hampton	4-10-0 Fertilizer	10.00	3.29	....
Hampton	5-8-0 Fertilizer	8.00	4.11	....
Hampton	5-7-0 Fertilizer	7.00	4.11	....
Hampton	5-7-1 Fertilizer	7.00	4.11	1.00
Hampton	7-6-0 Fertilizer	6.00	5.76	....
Hampton	5-7-2 Fertilizer	7.00	4.11	2.00
Hampton	7-6-2 Fertilizer	6.00	5.76	2.00
Hampton	7-8-0 Fertilizer	8.00	5.76	....
Hampton	7-8-1 Fertilizer	8.00	5.76	1.00
Hampton	7-8-2 Fertilizer	8.00	5.76	2.00
Hampton	7-6-1 Fertilizer	6.00	5.76	1.00
Hampton	10-5-0 Fertilizer	5.00	8.23	....
Hampton	10-5-1 Fertilizer	5.00	8.23	1.00
Hampton	10-5-2 Fertilizer	5.00	8.23	2.00
Hampton	9-3-0 Top Dresser	3.00	7.41	....
Hampton	9-4-0 Top Dresser	4.00	7.41	....
Hampton	10-5-0 Top Dresser	5.00	8.23	....
Hampton	10-5-1 Top Dresser	5.00	8.23	1.00
Hampton	10-4-2 Top Dresser	4.00	8.23	2.00
Nitrate of Soda		....	15.00	....

MARION HARPER COTTON OIL COMPANY,
EAST POINT, GA.

<i>Name of Brand</i>		<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Cotton Seed Meal		2.00	6.18	1½

Manufactured for S. B. Harrell & Co., Norfolk, Va., by the
POCOMOKE GUANO COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>		<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Harrell's Acid Phosphate		14.00	....	....
Harrell's Eclipse		9.00	2.26	2.00

W. S. HARRISS AND COMPANY,
WILSON, N. C.

<i>Name of Brand</i>		<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Harris'	H. G. 16 Per Cent Acid Phosphate	16.00	....	....
Harris'	Ammoniated Superphosphate	10.00	1.65	....
Harris'	Meal Mixture	9.00	2.26	2.00
Harris'	Co-Operator Guano	8.00	2.47	2.00
Harris'	Big Yield Guano	8.00	3.30	....
Harris'	Ampho Guano	6.00	3.30	....
Harris'	Panama Soda Mixture	9.00	2.47	....
Harris'	Special Guano	9.00	2.47	....
Harris'	Complete Guano	8.00	3.30	1.00
Harris'	Special Tobacco Guano	8.00	2.47	3.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Harris' Cotton Seed Meal .....	....	6.17	....
Harris' Golden Weed Guano	8.00	2.47	3.00
Harris' Standard Guano	8.00	1.65	2.00

HOME FERTILIZER AND CHEMICAL COMPANY,
BALTIMORE, MD.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Home Dissolved Animal Bone.....	12.00	1.65	....
Riosa Tobacco Compound	8.00	2.48	3.00
Cerealite Top Dressing .....	....	7.43	3.00
Home Fertilizer .....	....	5.77	7.00
Home Ammoniated Mixture	9.00	2.06	1.00
Home Eclipse Mixture	9.00	2.48	....
Yancey's Formula	8.00	2.48	2.00

THE HUBBARD FERTILIZER COMPANY,
BALTIMORE, MD.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Hubbard's All Crop Grower	9.00	2.05	2.00
Hubbard's 4-8-0 Fertilizer	8.00	3.28	....
Hubbard's 4-6-0 Fertilizer	6.00	3.28	....
Hubbard's Ammoniated Fertilizer	10.00	2.46	....
Hubbard's 3-9-0 Fertilizer	9.00	2.46	....
Hubbard's Yellow Wrapper	8.00	2.46	3.00
Hubbard's Yellow Wrapper, Revised	8.00	2.46	2.00
Hubbard's 3-8-1 Fertilizer	8.00	2.46	1.00
Hubbard's 2-9-2 Fertilizer	9.00	1.64	2.00
Hubbard's Exchange Guano	8.00	1.64	2.00
Hubbard's 16 Per Cent Phosphate.....	16.00	....	....
Hubbard's 5-8-0 Fertilizer	8.00	4.10	....
Hubbard's 5-8-1 Fertilizer	8.00	4.10	1.00
Hubbard's 5-8-2 Fertilizer	8.00	4.10	2.00
Hubbard's 9-0-3 Top Dresser Fertilizer.....	....	7.38	3.00
Hubbard's 9-3-0 Top Dresser Fertilizer.....	3.00	7.38	....
Hubbard's 9-5-0 Top Dresser Fertilizer.....	5.00	7.38	....
Hubbard's 9-5-1 Top Dresser Fertilizer.....	5.00	7.38	1.00
Hubbard's 4-6-1 Fertilizer	6.00	3.28	1.00
Hubbard's 14 Per Cent Phosphate.....	14.00	....	....
Hubbard's Truck Fertilizer	6.00	4.10	....
Hubbard's 3-4-3 Fertilizer	4.00	2.46	3.00
Hubbard's New Process Top Dresser, Revised.....	3.00	7.38	1.00

M. P. HUBBARD COMPANY, Inc.,
BALTIMORE, MD.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Hubbard's Dissolved Phosphate	16.00	....	....
Hubbard's Ground Fish .....	....	8.25	....
Hubbard's Giant Compound	10.00	2.47	....
Hubbard's Nitrate of Soda .....	....	14.85	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Hubbard's Animal, Fish, and Ammonia Compound.....	8.00	2.47	2.00
Hubbard's Big Crop Compound	8.00	3.30	....
Hubbard's Everybody's Formula	9.00	2.47	....
Hubbard's Fish Mixture	8.00	4.10	....
Hubbard's Great Harvest	10.00	1.65	....
Hubbard's Havana Special	8.00	2.47	1.00
Hubbard's Acme Guano	12.00	1.65	....
Hubbard's Special Grower	10.00	3.30	....
Hubbard's Maryland Special	7.00	4.10	2.00
Hubbard's Royal Excelsior	8.00	1.00	2.00
Hubbard's Favorite Guano	12.00	2.47	....
Hubbard's Soluble Phosphate	14.00	....	....

THE IMPERIAL COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Imperial 14 Per Cent Acid Phosphate.....	14.00	....	....
Imperial 16 Per Cent Acid Phosphate.....	16.00	....	....
Imperial 1-11-0 Fertilizer	11.00	.82	....
Imperial 1-10-1 Fertilizer	10.00	.82	1.00
Imperial Standard Premium Guano	8.00	1.65	2.00
Imperial 2-10-0 Fertilizer	10.00	1.65	....
Imperial 2-12-0 Fertilizer	12.00	1.65	....
Imperial 2-9-1 Fertilizer	9.00	1.65	1.00
Imperial 2-9-2 Fertilizer	9.00	1.65	2.00
Imperial 2-11-0 Fertilizer	11.00	1.65	....
Imperial 2-10-1 Fertilizer	10.00	1.65	1.00
Imperial Tobacco Guano	8.00	1.65	2.00
Imperial Crop Grower	8.00	1.65	2.00
Imperial 2¼-9-2 Fertilizer	9.00	1.85	2.00
Imperial 2¼-9-1 Fertilizer	9.00	1.85	1.00
Imperial 2½-10-1 Fertilizer	10.00	2.06	1.00
Imperial Martin County Special Crop Grower.....	9.00	2.26	2.00
Imperial 3-9-1 Fertilizer	9.00	2.47	1.00
Imperial 3-10-0 Fertilizer	10.00	2.47	....
Imperial 3-8-1 Fertilizer	8.00	2.47	1.00
Imperial 3-9-0 Fertilizer	9.00	2.47	....
Imperial X-L-O Crop Grower	8.00	2.47	2.00
Imperial Cubanola Tobacco Guano	8.00	2.47	2.00
Imperial 4-8-1 Fertilizer	8.00	3.29	1.00
Imperial 4-6-0 Fertilizer	6.00	3.29	....
Imperial 4-8-0 Fertilizer	8.00	3.29	....
Imperial 4-10-0 Fertilizer	10.00	3.29	....
Imperial 4-8-2 Fertilizer	8.00	3.29	2.00
Imperial 5-7-1 Fertilizer	7.00	4.11	1.00
Imperial 5-8-0 Fertilizer	8.00	4.11	....
Imperial 7-6-0 Fertilizer	6.00	5.76	....
Imperial 7-8-0 Fertilizer	8.00	5.76	....
Imperial 7-6-1 Fertilizer	6.00	5.76	1.00
Imperial 9-3-0 Top Dresser	3.00	7.41	....
Imperial 9-4-0 Top Dresser	4.00	7.41	....
Imperial 10-5-0 Fertilizer	5.00	8.23	....
Imperial 10-5-1 Fertilizer	5.00	8.23	1.00
Imperial 10-5-0 Top Dresser	5.00	8.23	....
Imperial 10-5-1 Top Dresser	5.00	8.23	1.00
Imperial Cisco Soluble Guano.....	8.00	1.65	2.00
Imperial Snowflake Special	8.00	3.29	3.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Imperial Yellow Bark Sweet Potato Guano.....	8.00	2.47	3.00
Imperial 3-8-3 Fertilizer	8.00	2.47	3.00
Imperial Catawba Wheat Grower	10.00	....	4.00
Imperial Dry Ground Fish.....	....	8.23	10.00
Imperial 1-10-2 Fertilizer	10.00	.82	2.00
Imperial 5-8-3 Fertilizer	8.00	4.11	3.00
Imperial 4-6-1 Fertilizer	6.00	3.29	1.00
Imperial Nitrate of Soda.....	....	15.00	....
Imperial 4-9-0 Fertilizer	9.00	3.29	....
Imperial 5-7-0 Fertilizer	7.00	4.11	....
Imperial 5-9-0 Fertilizer	9.00	4.11	....
Imperial 7-6-2 Fertilizer	6.00	5.76	2.00

INTERNATIONAL AGRICULTURAL CORPORATION,
ATLANTA, GA., AND SPARTANBURG, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
O. H. Fertilizer	10.00	1.65	2.00
O. H. Fertilizer	10.00	2.06	1.00
O. H. Fertilizer	9.00	1.65	3.00
O. H. Fertilizer	9.00	1.65	2.00
O. H. Fertilizer	8.00	1.65	2.00
O. H. Fertilizer	9.00	1.65	1.00
Ammoniated Compound	12.00	2.47	....
Ammoniated Compound	12.00	1.65	....
Ammoniated Compound	11.00	.82	....
Ammoniated Compound	10.00	2.47	....
Ammoniated Compound	10.00	1.65	....
Ammoniated Compound	9.00	2.47	....
Ammoniated Compound	8.00	4.12	....
Ammoniated Compound	8.00	3.29	....
International Bone and Potash.....	11.00	....	1.00
International Bone and Potash.....	10.00	....	2.00
High Grade Dissolved Bone.....	18.00	....	....
High Grade Acid Phosphate.....	16.00	....	....
Acid Phosphate	14.00	....	....
Nitrate of Soda .....	....	14.81	....

KERSHAW OIL MILL,
KERSHAW, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Cotton Seed Meal	1.50	6.18	1.00

LAKELAND PHOSPHATE COMPANY,
LAKELAND, FLA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
"Naturesown" Pulverized Raw Phosphate.....	Total Phos. Acid, 32 Per Cent		

LANIER BROTHERS,
NASHVILLE, TENN.

Jersey Brand Cotton Seed Meal.....	7½ Per Cent Ammonia
Canary Brand High Grade Cotton Seed Meal.....	8 Per Cent Ammonia

LENOIR OIL AND ICE COMPANY,
KINSTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Acid Phosphate and Cotton Seed Meal Mixture.....	9.00	2.88	1.00
L. O. and I. Co.'s Acid Phosphate.....	16.00	....	....

LISTERS AGRICULTURAL CHEMICAL WORKS,
NEWARK, N. J.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Buyer's Choice Acid Phosphate.....	14.00	....	....
High Grade Acid Phosphate.....	16.00	....	....
Crescent Ammoniated Superphosphate, 1916	10.00	1.65	....
Excelsior Guano, 1916	10.00	2.47	....
Superior Ammoniated Superphosphate, 1916	10.00	3.29	....
Atlas Brand Fertilizer, 1916	8.00	4.11	....
Standard Pure Superphosphate of Lime, 1916.....	9.00	1.65	1.00
Ammoniated Dissolved Bone Phosphate, 1916.....	8.00	2.06	2.00
Complete Manure, 1916	8.00	2.47	1.00
Special Tobacco Fertilizer, 1916.....	8.00	2.06	2.00
Carolina Bright for Tobacco, 1916.....	9.00	2.47	2.00
Harvest Queen Phosphate, 1916	8.00	1.65	2.00

McCABE FERTILIZER COMPANY,
CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
McCabe's Perfection	8.00	2.47	3.00
McCabe's Special No. 4	8.00	2.47	2.00
McCabe's Special No. 5	8.00	2.47	1.00
McCabe's Special No. 3	8.00	3.29	....
McCabe's Special No. 6	12.00	1.65	....
McCabe's Special No. 7	10.00	3.29	....
McCabe's Acid Phosphate	16.00	....	....
McCabe's Special No. 8	7.00	6.59	1.00
McCabe's Special No. 9	6.00	3.29	....
McCabe's Special No. 10	8.00	1.65	2.00
McCabe's Special No. 11	9.00	2.47	1.00

THE MACMURPHY COMPANY,
CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
High Grade Acid Phosphate, 16 Per Cent.....	16.00	....	....
High Grade Acid Phosphate, 14 Per Cent.....	14.00	....	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Wilcox, Gibbs & Co.'s Manipulated Guano.....	9.00	2.26	1.00
Special 8-3-1 Guano	8.00	2.47	1.00
Special 8-4-1 Guano	8.00	3.29	1.00
Special 8-4-0 Guano	8.00	3.29	....
Special 8-2-2 Guano	8.00	1.65	2.00
Special 8-3-2 Guano	8.00	2.47	2.00
Special 8-3-3 Guano	8.00	2.47	3.00
Special 8-4-2 Guano	8.00	3.29	2.00
Special 8-4-3 Guano	8.00	3.29	3.00
Special 9-2-2 Guano	9.00	1.65	2.00
Special 9-2-3 Guano	9.00	1.65	3.00
Special 9-3-1 Guano	9.00	2.47	1.00
Special 9-3-2 Guano	9.00	2.47	2.00
Special 9-3-3 Guano	9.00	2.47	3.00
Special 9-3-0 Guano	9.00	2.47	....
Special 9-5-0 Guano	9.00	4.12	....
Special 9-5-1 Guano	9.00	4.12	1.00
Special 10-4-0 Guano	10.00	3.29	....
Special 10-6-0 Guano	10.00	4.92	....
Special 10-6-1 Guano	10.00	4.92	1.00
Special 4-6-0 Top Dresser	4.00	4.92	....
Special 4-7½-0 Top Dresser	4.00	6.17	....
Special 4-7½-01 Top Dresser	4.00	6.17	1.00
Special 6-10-0 Top Dresser	6.00	8.23	....
Nitrate of Soda .....	....	14.81	....
Special 6-4-0	6.00	3.29	....

McNAIR PHOSPHATE COMPANY,

LAURINBURG, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
6-4 Ammoniated Guano	6.00	3.28	....
8-4 Ammoniated Guano	8.00	3.28	....
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
9-3 Ammoniated Guano	9.00	2.46	....

* MARIETTA FERTILIZER COMPANY,

GREENSBORO, CHICAGO, AND WILMINGTON.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Ammoniated Superphosphate	12.00	3.30	....
Ammoniated Superphosphate	12.00	2.47	....
Ammoniated Superphosphate	12.00	1.65	....
Ammoniated Superphosphate	12.00	.82	....
Ammoniated Superphosphate	11.00	3.30	....
Ammoniated Superphosphate	11.00	2.47	....
Fertilizer No. 1121	11.00	1.65	1.00
Ammoniated Superphosphate	11.00	1.65	....
Ammoniated Superphosphate	11.00	.82	....
Marietta Truck Guano	10.00	3.30	4.00
Ammoniated Superphosphate	10.00	3.30	....
Marietta Ammoniated Bone	10.00	2.47	3.00
Ammoniated Superphosphate	10.00	2.47	....
Langford's Special	10.00	1.65	4.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Marietta Special Formula	10.00	1.65	3.00
Royal Seal Guano	10.00	1.65	2.00
Fertilizer No. 1021	10.00	1.65	1.00
Grain Special	10.00	1.65	....
Ammoniated Superphosphate	10.00	1.65	....
Special Mixture	10.00	1.03	6.00
Marietta Special Ground	10.00	.82	3.00
Fertilizer No. 1011	10.00	.82	1.00
Fertilizer No. 1011, for Grain.....	10.00	.82	1.00
Special Grain Fertilizer	10.00	.62	2.00
Special Grain Fertilizer	10.00	.41	2.00
Special Grain Fertilizer	10.00	.20	2.00
Ammoniated Superphosphate	9.00	3.30	....
Marietta Blood and Bone.....	9.00	2.47	3.00
Phosphate and Potash	12.00	....	2.00
Phosphate and Potash	11.00	....	1.00
Bone and Potash	10.00	....	6.00
Potash Mixture	10.00	....	5.00
Potash Special	10.00	....	4.00
Phosphate and Potash	10.00	....	3.00
Phosphate and Potash	9.00	....	3.00
Golden Grain Grower	8.00	....	4.00
Extra High Grade Acid Phosphate.....	17.00	....	....
High Grade Acid Phosphate.....	16.00	....	....
High Grade Acid Phosphate.....	14.00	....	....
Acid Phosphate	13.00	....	....
Acid Phosphate	12.00	....	....
Kainit .....	....	....	12.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	50.00
Nitrate of Soda .....	....	14.81	....
Dried Blood .....	....	13.16	....
10 Per Cent Tankage.....	....	8.23	....
Bone Meal (Total)	24.00	2.47	....
Raw Bone Meal (Total).....	22.00	3.70	....
Cotton Seed Meal .....	....	6.18	....
Sulphate of Ammonia .....	....	20.56	....
Marietta Fertilizer No. 932	9.00	2.47	2.00
Fertilizer No. 931	9.00	2.47	1.00
Ammoniated Superphosphate	9.00	2.47	....
Fertilizer No. 92½5	9.00	2.05	5.00
Fertilizer No. 92½3	9.00	2.05	3.00
Fertilizer No. 92½1	9.00	2.05	1.00
Fertilizer No. 92¼4	9.00	1.85	4.00
Marietta Blood, Bone and Potash Special	9.00	1.65	3.00
Fertilizer No. 921 for Grain.....	9.00	1.65	1.00
Fertilizer No. 921	9.00	1.65	1.00
Marietta Blood and Bone Special.....	9.00	.82	3.00
Marietta Beef Blood and Bone.....	9.00	.82	2.00
Blood, Bone and Potash.....	8.00	4.11	7.00
Fertilizer No. 855	8.00	4.11	5.00
Marietta Fertilizer No. 852.....	8.00	4.11	2.00
Fertilizer No. 845	8.00	3.30	5.00
Fertilizer No. 844	8.00	3.30	4.00
Fertilizer No. 841	8.00	3.30	1.00
Ammoniated Superphosphate	8.00	3.30	....
Marietta Fertilizer No. 837.....	8.00	2.47	7.00
Fertilizer No. 836	8.00	2.47	6.00
Fertilizer No. 835	8.00	2.47	5.00
Fertilizer No. 833	8.00	2.47	3.00
Pride of Piedmont	8.00	2.47	3.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Pride of Piedmont for Tobacco.....	8.00	2.47	3.00
Fertilizer No. 831 for Grain.....	8.00	2.47	1.00
Fertilizer No. 831	8.00	2.47	1.00
Best for Tobacco	8.00	2.05	3.00
Farmer's Choice	8.00	2.05	3.00
Farmer's Choice for Tobacco	8.00	2.05	3.00
Fertilizer No. 825	8.00	1.65	5.00
Fertilizer No. 823	8.00	1.65	3.00
Solid South	8.00	1.65	2.00
Solid South Tobacco Guano	8.00	1.65	2.00
Solid South for Grain	8.00	1.65	2.00
Fertilizer No. 813	8.00	.82	3.00
Fertilizer No. 758	7.00	4.11	8.00
Fertilizer No. 755	7.00	4.11	5.00
Ammoniated Superphosphate	7.00	4.11	....
Fertilizer No. 672	6.00	5.76	2.00
7 Per Cent Trucker	6.00	5.76	5.00
5 Per Cent Trucker	6.00	4.11	7.00
Fertilizer No. 637	6.00	2.47	7.00
Marietta Top Dresser	4.00	6.18	2.50
Fertilizer No. 445	4.00	3.30	5.00
Marietta Top Dresser	3.00	8.23	5.00
Marietta Top Dresser .....	....	7.81	4.00
Marietta Top Dresser .....	....	7.40	3.00
Marietta Fertilizer Company's 15-2.....	15.00	....	2.00
Marietta 13 and 4.....	13.00	....	4.00
Marietta Potash Acid	12.00	....	6.00
Marietta Phosphate and Potash.....	12.00	....	4.00
Fertilizer No. 832	8.00	2.47	2.00
Ammoniated Superphosphate	6.00	3.30	....

MAYBANK FERTILIZER COMPANY.

CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Maybank Fish Guano.....	8.00	2.47	2.00
Maybank Fish Guano.....	8.00	3.29	1.00
Maybank Ammoniated Superphosphate.....	8.00	3.29	....
Maybank Ammoniated Superphosphate.....	9.00	2.47	....
Maybank Early Opener.....	5.00	8.23	....
Maybank Early Opener	4.00	6.17	....
16 per cent Maybank H. G. Dissolved Bone.....	16.00	....	....
14 per cent Maybank Acid Phosphate.....	14.00	....	....
Nitrate of Soda	18.00	14.83	....
Dried Fish Scrap.....	2.50	4.94	....

E. H. & J. A. MEADOWS COMPANY.

NEW BERN, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Meadows Cotton Guano.....	10.00	2.00	....
Meadows Cotton Guano	12.00	2.00	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Meadows Gold Leaf Tobacco Guano Special.....	9.00	3.00	....
Meadows Ideal Tobacco Guano Special.....	8.00	4.00	....
Meadows Labos Guano Special.....	8.00	5.00	....
Meadows Great Potato Guano Special.....	7.00	5.00	....
Meadows Great Cabbage Guano.....	7.00	7.00	....
Meadows Sea Bird Guano Special.....	8.00	3.00	....
Diamond Acid Phosphate	16.00	....	....
Meadows Gold Leaf Tobacco Guano.....	8.00	3.00	2.00
Meadows Ideal Tobacco Guano	8.00	4.00	2.00
Meadows Great Potato Guano.....	7.00	5.00	2.00
Meadows Special Guano	8.00	2.00	2.00
Meadows Special Cabbage Guano.....	7.00	7.00	2.00

THE MILLER FERTILIZER COMPANY,
BALTIMORE, MD.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Ammoniated Dissolved Bone.....	8.00	1.65	2.00
Miller's Special Fertilizer.....	8.00	3.30	1.00
Miller's Best	8.00	2.47	1.00
Miller's Acme	9.00	1.65	1.00
Miller's Ammoniated Phosphate.....	9.00	2.47	....
Miller's Ammoniated Bone Phosphate.....	8.00	3.30	....
Miller's Favorite	6.00	3.30	....
Miller's Hustler	10.00	3.30	....
Farmers Profit	8.00	1.65	2.00
Miller's Tobacco Special.....	8.00	2.47	2.00
Acid Phosphate	14.00	....	....
Acid Phosphate	16.00	....	....
Miller's Unexcelled	10.00	1.65	....
Quickstep	9.00	4.12	1.00
R's Special	8.00	3.30	2.00
Miller's Special Top Dressing.....	4.00	8.24	....
The Miller Fertilizer Co.'s 10-4 per cent.....	10.00	....	4.00
Clinch	10.00	....	2.00
Miller's Standard	8.00	2.47	2.00
Ground Bone	B. P. L. 30.00	2.47	....
Miller's No. 1 Hustler.....	10.00	4.12	....
Miller's Special 3 per cent.....	8.00	2.47	3.00
Tobacco King	8.00	2.47	3.00

MALONEY & CARTER CO.,
CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Acid Phosphate	16.00	....	....
Acid Phosphate	14.00	....	....
High Grade Tankage.....	3.00	8.22	....
Dry Ground Blood.....	....	13.16	....
Nitrate of Soda.....	....	14.80	....
Blood .....	....	13.58	....
High Grade Tankage.....	2.75	8.16	....
Dry Ground Blood.....	....	14.08	....

NEW BERN COTTON OIL COMPANY AND FERTILIZER MILLS,
NEW BERN, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Eureka Top Dresser.....	.....	8.28	3.00
High Grade Fish Scrap.....	.....	8.25	....
Sulphate of Potash .....	.....	....	50.00
Muriate of Potash.....	.....	....	48.00
Genuine German Kainit.....	.....	....	12.00
Thomas Phosphate	18.00	....	....
Ground Blood .....	.....	13.20	....
Special Cotton Seed Meal Mixture.....	8.00	2.47	3.00
Bone Meal	16.00	2.47	....
Green County Tobacco Fertilizer.....	9.00	2.47	5.00
Cotton Seed Meal .....	.....	5.77	....
Ground Tankage .....	.....	9.00	....
Hart's Special Tobacco Grower.....	6.00	2.47	6.00
Sparrow's Special Tobacco Grower.....	9.00	2.47	3.00
Nancy Hall Sweet Potato Guano.....	7.00	2.88	10.00
Special Truck Grower.....	7.00	4.12	5.00
Special Tobacco Grower.....	8.00	2.47	2.00
Special Meal and Fish Guano.....	8.00	2.47	2.00
Excelsior Tobacco Grower.....	8.00	3.30	2.00
Special Corn and Cotton Grower.....	10.00	1.65	....
16 per cent Acid Phosphate.....	16.00	....	....
14 per cent Acid Phosphate.....	14.00	....	....
Special Corn and Peanut Grower.....	11.00	....	2.00
High Grade Bone and Potash.....	10.00	....	4.00
Carteret Bone and Potash.....	10.00	....	2.00
Oriole Tobacco Grower.....	8.00	3.30	4.00
Harvey's Special Meal and Fish Guano.....	8.00	2.47	3.00
Foy's High Grade Fertilizer.....	8.00	2.47	3.00
Lenoir Bright Leaf Tobacco Grower.....	8.00	2.47	3.00
Pitts Prolific Golden Tobacco Guano.....	8.00	2.47	3.00
Favorite Cotton Grower.....	8.00	2.27	2.00
Onslow Farmers' Reliance Guano.....	8.00	2.06	3.00
Jones County Premium Crop Grower.....	8.00	2.06	3.00
Craven Cotton Guano.....	8.00	1.65	2.00
Green County Standard Fertilizer.....	8.00	1.65	2.00
Dunn's Standard Truck Grower.....	7.00	5.77	7.00
Ive's Irish Potato Guano.....	7.00	4.12	7.00
Eureka Tobacco Fertilizer.....	6.00	3.30	7.00
Pamlico Electric Top Dresser.....	5.00	8.25	2.50
Wooten's Special Tobacco Guano.....	4.00	3.30	6.00
Sulphate of Ammonia.....	....	20.62	....
Nitrate of Soda.....	....	15.67	....
Superb Tobacco Guano (C. S. M.).....	8.00	2.47	2.00
Special Truck Grower.....	7.00	4.12	1.00
Banner Truck Guano.....	5.00	8.25	....
Neuse Tobacco Grower.....	8.00	2.47	1.00
Standard Crop Grower.....	8.00	3.30	....
McCotter's Irish Potato Guano.....	8.00	4.95	.50
Superb Tobacco Grower.....	8.00	2.47	2.00
Onslow Crop Grower.....	9.00	2.47	....
Famous Cotton Grower.....	9.00	2.47	.50
Exum's Meal and Fish Guano.....	10.00	3.30	....
Acid Phosphate and C. S. M. Fertilizer.....	9.00	2.47	1.00
Ive's Irish Potato Guano Special.....	7.00	4.12	3.00
Faucette's Choice Tobacco Grower.....	4.00	3.30	3.00
McCotter's Special Truck Grower.....	8.00	4.12	....

NITRATE AGENCIES COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
N. A. C. Brand Nitrate of Soda.....	15.00	....
N. A. C. Brand Acid Phosphate.....	16.00	....	....
N. A. C. Brand Ground Dried Blood.....	13.16	....
N. A. C. Brand Ground High Grade Animal Tankage.....	6.99	....
N. A. C. Brand Ground H. G. Animal Tankage.....	7.40	....
N. A. C. Brand Ground H. G. Animal Tankage.....	8.22	....
N. A. C. Brand Ground H. G. Animal Tankage.....	6.68	....
N. A. C. Brand Ground Dried Fish.....	8.25	....
N. A. C. Brand Peruvian Guano.....	6.00	9.00	1.00
N. A. C. Brand Ground Animal Tankage.....	8.00	....

NORFOLK FERTILIZING COMPANY, INC.,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Oriana 14 per cent Acid Phosphate.....	14.00	....	....
Oriana 16 per cent Acid Phosphate.....	16.00	....	....
Oriana 1-11-0 Fertilizer	11.00	.82	....
Oriana 1-10-1 Fertilizer	10.00	.82	1.00
Oriana 2-10-0 Fertilizer	10.00	1.65	....
Oriana 2-12-0 Fertilizer	12.00	1.65	....
Oriana 2-9-1 Fertilizer	9.00	1.65	1.00
Oriana 2-9-2 Fertilizer	9.00	1.65	2.00
Oriana 2-11-0 Fertilizer	11.00	1.65	....
Oriana 2-10-1 Fertilizer	10.00	1.65	1.00
Oriana Crop Grower	8.00	1.65	2.00
Oriana Tobacco Guano	8.00	1.65	2.00
Oriana 2¼-9-2 Fertilizer	9.00	1.85	2.00
Oriana 2¼-9-1 Fertilizer.....	9.00	1.85	1.00
Oriana 2½-10-1 Fertilizer	10.00	2.06	1.00
Oriana 2¾-9-2 Fertilizer	9.00	2.26	2.00
Oriana 3-8-1 Fertilizer	8.00	2.47	1.00
Oriana 3-9-1 Fertilizer	9.00	2.47	1.00
Oriana 3-10-0 Fertilizer	10.00	2.47	....
Oriana 3-8-2 Fertilizer	8.00	2.47	2.00
Oriana 4-8-1 Fertilizer	8.00	3.29	1.00
Oriana 4-6-0 Fertilizer	6.00	3.29	....
Oriana 4-8-0 Fertilizer	8.00	3.29	....
Oriana 4-10-0 Fertilizer	10.00	3.29	....
Oriana 4-8-2 Fertilizer	8.00	3.29	2.00
Oriana 5-8-0 Fertilizer	8.00	4.11	....
Oriana 5-7-1 Fertilizer	7.00	4.11	1.00
Oriana 7-6-0 Fertilizer	6.00	5.76	....
Oriana 7-8-0 Fertilizer	8.00	5.76	....
Oriana 7-6-1 Fertilizer	6.00	5.76	1.00
Oriana 9-3-0 Top Dresser.....	3.00	7.41	....
Oriana 9-4-0 Top Dresser.....	4.00	7.41	....
Oriana 10-5-0 Fertilizer	5.00	8.23	....
Oriana 10-5-1 Fertilizer	5.00	8.23	1.00
Oriana 10-5-0 Top Dresser.....	5.00	8.23	....
Oriana 10-5-1 Top Dresser.....	5.00	8.23	1.00
Oriana 3-9-0 Fertilizer	9.00	2.47	....
Oriana 3-9-2 Fertilizer	9.00	2.47	2.00
Oriana Nitrate of Soda.....	....	15.00	....
Norfolk Dry Ground Fish.....	....	8.23	....
Oriana 5-7-0 Fertilizer	7.00	4.11	....

NORFOLK TALLOW COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Notalco Pure Ground Bone.....	22.00	2.06	....
Notalco Pure Raw Bone Meal.....	22.00	3.70	....
Notalco Pure Ground Tankage.....	8.00	5.75	....

THE NORTH CAROLINA FARMERS UNION,
STATESVILLE, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
N. C. Farmers Union 12-2-1 Guano.....	12.00	1.65	1.00
N. C. Farmers Union 11-21 Guano.....	11.00	1.65	1.00
N. C. Farmers Union 10-4-4 Guano.....	10.00	3.29	4.00
N. C. Farmers Union 10-4-2 Guano.....	10.00	3.29	2.00
N. C. Farmers Union 10-4-1 Guano.....	10.00	3.29	1.00
N. C. Farmers Union 10-3-3 Guano.....	10.00	2.47	3.00
N. C. Farmers Union 10-3-2 Guano.....	10.00	2.47	2.00
N. C. Farmers Union 10-3-1 Guano.....	10.00	2.47	1.00
N. C. Farmers Union 10-2-2 Guano.....	10.00	1.65	2.00
N. C. Farmers Union 10-2-2 Tobacco Guano.....	10.00	1.65	2.00
N. C. Farmers Union 10-2-1 Guano.....	10.00	1.65	1.00
N. C. Farmers Union 10-1-1 Guano.....	10.00	.82	1.00
N. C. Farmers Union 10-1-1 Tobacco Guano.....	10.00	.82	1.00
N. C. Farmers Union 10-1 1/4-6 Guano.....	10.00	1.03	6.00
N. C. Farmers Union 9-3-6 Tobacco Guano.....	9.00	2.47	6.00
N. C. Farmers Union 9-4-2 Tobacco Guano.....	9.00	3.29	2.00
N. C. Farmers Union 9-3-3 Guano.....	9.00	2.47	3.00
N. C. Farmers Union 9-3-2 Guano.....	9.00	2.47	2.00
N. C. Farmers Union 9-3-2 Tobacco Guano.....	9.00	2.47	2.00
N. C. Farmers Union 9-3-1 Guano.....	9.00	2.47	1.00
N. C. Farmers Union 9-2 3/4-2 Guano.....	9.00	2.26	2.00
N. C. Farmers Union 9-2 3/4-2 Tobacco Guano.....	9.00	2.26	2.00
N. C. Farmers Union 9-2 1/4-4 Guano.....	9.00	1.85	4.00
N. C. Farmers Union 9-2 1/4-2 Guano.....	9.00	1.85	2.00
N. C. Farmers Union 9-2 1/4-2 Tobacco Guano.....	9.00	1.85	2.00
N. C. Farmers Union 9-2-3 Guano.....	9.00	1.65	3.00
N. C. Farmers Union 9-2-2 Guano.....	9.00	1.65	2.00
N. C. Farmers Union 9-2-1 Guano.....	9.00	1.65	1.00
N. C. Farmers Union 9-2-1 Tobacco Guano.....	9.00	1.65	1.00
N. C. Farmers Union 9-1-3 Guano.....	9.00	.82	3.00
N. C. Farmers Union 9-1-2 Guano.....	9.00	.82	2.00
N. C. Farmers Union 8-5-1 Guano.....	8.00	4.11	1.00
N. C. Farmers Union 8-4-6 Tobacco Guano.....	8.00	3.29	6.00
N. C. Farmers Union 8-4-2 Guano.....	8.00	3.29	2.00
N. C. Farmers Union 8-4-2 Tobacco Guano.....	8.00	3.29	2.00
N. C. Farmers Union 8-4-1 Guano.....	8.00	3.29	1.00
N. C. Farmers Union 8-4-4 Guano.....	8.00	3.29	4.00
N. C. Farmers Union 8-3-5 Guano.....	8.00	2.47	5.00
N. C. Farmers Union 8-3-5 Tobacco Guano.....	8.00	2.47	5.00
N. C. Farmers Union 8-3-3 Guano.....	8.00	2.47	3.00
N. C. Farmers Union 8-3-3 Tobacco Guano.....	8.00	2.47	3.00
N. C. Farmers Union 8-3-2 Guano.....	8.00	2.47	2.00
N. C. Farmers Union 8-3-2 Tobacco Guano.....	8.00	2.47	2.00
N. C. Farmers Union 8-3-1 Guano.....	8.00	2.47	1.00
N. C. Farmers Union 8-3-1 Tobacco Guano.....	8.00	2.47	1.00
N. C. Farmers Union 8-2 3/4-7 Tobacco Guano.....	8.00	2.26	7.00
N. C. Farmers Union 8-2 1/2-3 Guano.....	8.00	2.06	3.00
N. C. Farmers Union 8-2 1/2-3 Tobacco Guano.....	8.00	2.06	3.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
N. C. Farmers Union 8-2½-2 Guano.....	8.00	2.06	2.00
N. C. Farmers Union 8-2½-2 Tobacco Guano.....	8.00	2.06	2.00
N. C. Farmers Union 8-2-10 Guano.....	8.00	1.65	10.00
N. C. Farmers Union 8-2-3 Guano	8.00	1.65	3.00
N. C. Farmers Union 8-2-2 Guano.....	8.00	1.65	2.00
N. C. Farmers Union 8-2-2 Tobacco Guano.....	8.00	1.65	2.00
N. C. Farmers Union 8-1-4 Guano.....	8.00	.82	4.00
N. C. Farmers Union 8-1-3 Guano.....	8.00	.82	3.00
N. C. Farmers Union 7-5-8 Guano.....	7.00	4.11	8.00
N. C. Farmers Union 7-5-2 Guano.....	7.00	4.11	2.00
N. C. Farmers Union 7-4-5 Guano.....	7.00	3.29	5.00
N. C. Farmers Union 7-3-2 Guano.....	7.00	2.47	2.00
N. C. Farmers Union 7-3-2 Tobacco Guano.....	7.00	2.47	2.00
N. C. Farmers Union 6-5-1 Guano.....	6.00	4.11	1.00
N. C. Farmers Union 6-4-1 Guano.....	6.00	3.29	1.00
N. C. Farmers Union 5-7-3 Guano.....	5.00	5.76	3.00
N. C. Farmers Union 5-7-2 Guano.....	5.00	5.76	2.00
N. C. Farmers Union 5-4-2 Guano.....	5.00	3.29	2.00
N. C. Farmers Union 0-9-3 Top Dresser.....	....	7.40	3.00
N. C. Farmers Union 4-7 ½-2 Top Dresser.....	4.00	6.17	2.00
N. C. Farmers Union 2-10-2 Top Dresser.....	2.00	8.23	2.00
N. C. Farmers Union 12-4-0 Superphosphate.....	12.00	3.29	....
N. C. Farmers Union 12-3-0 Superphosphate.....	12.00	2.47	....
N. C. Farmers Union 12-2-0 Superphosphate.....	12.00	1.65	....
N. C. Farmers Union 11-3-0 Superphosphate.....	11.00	2.47	....
N. C. Farmers Union 11-1-0 Superphosphate.....	11.00	.82	....
N. C. Farmers Union 10-5-0 Superphosphate.....	10.00	4.11	....
N. C. Farmers Union 10-4-0 Superphosphate.....	10.00	3.29	....
N. C. Farmers Union 10-3-0 Superphosphate.....	10.00	2.47	....
N. C. Farmers Union 10-2-0 Superphosphate.....	10.00	1.65	....
N. C. Farmers Union 9-3-0 Superphosphate.....	9.00	2.47	....
N. C. Farmers Union 8-6-0 Superphosphate.....	8.00	4.94	....
N. C. Farmers Union 8-5-0 Superphosphate.....	8.00	4.11	....
N. C. Farmers Union 8-4-0 Superphosphate.....	8.00	3.29	....
N. C. Farmers Union 6-4-0 Superphosphate.....	6.00	3.29	....
N. C. Farmers Union 5-7-0 Superphosphate.....	5.00	5.76	....
N. C. Farmers Union 12-6 Bone and Potash.....	12.00	....	6.00
N. C. Farmers Union 12-5 Bone and Potash.....	12.00	....	5.00
N. C. Farmers Union 12-4 Bone and Potash.....	12.00	....	4.00
N. C. Farmers Union 12-3 Bone and Potash.....	12.00	....	3.00
N. C. Farmers Union 12-2 Bone and Potash.....	12.00	....	2.00
N. C. Farmers Union 10-6 Bone and Potash.....	10.00	....	6.00
N. C. Farmers Union 10-5 Bone and Potash.....	10.00	....	5.00
N. C. Farmers Union 10-4 Bone and Potash.....	10.00	....	4.00
N. C. Farmers Union 10-3 Bone and Potash.....	10.00	....	3.00
N. C. Farmers Union 10-2 Bone and Potash.....	10.00	....	2.00
N. C. Farmers Union 8-5 Bone and Potash.....	8.00	....	5.00
N. C. Farmers Union 8-4 Bone and Potash.....	8.00	....	4.00
N. C. Farmers Union Concentrated Acid Phosphate.....	24.00	....	....
N. C. Farmers Union 16 per cent Acid Phosphate.....	16.00	....	....
N. C. Farmers Union 14 per cent Acid Phosphate.....	14.00	....	....
N. C. Farmers Union 13 per cent Acid Phosphate.....	13.00	....	....
N. C. Farmers Union 12 per cent Acid Phosphate.....	12.00	....	....
N. C. Farmers Union Pure Raw Bone Meal (Total).....	20.60	3.70	....
N. C. Farmers Union Nitrate of Soda.....	....	14.81	....
N. C. Farmers Union Fish Scrap.....	....	8.23	....
N. C. Farmers Union Cotton Seed Meal.....	....	6.17	....
N. C. Farmers Union Basic Slag (Total P. A.).....	17.00	....	....
N. C. Farmers Union Dried Blood .....	....	....	....
N. C. Farmers Union Tankage .....	....	....	....
N. C. Farmers Union Agricultural Ground Limestone .....	....	....	....

NAVASSA GUANO COMPANY,
WILMINGTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Navassa 17 per cent Acid Phosphate.....	17.00	....	....
Navassa 16 per cent Acid Phosphate.....	16.00	....	....
Navassa Acid Phosphate.....	14.00	....	....
Navassa Dissolved Bone.....	13.00	....	....
Navassa Acid Phosphate.....	12.00	....	....
Navassa Wheat Belt Special.....	12.00	....	6.00
Navassa Special Grain Mixture.....	12.00	....	5.00
Navassa Gray Land Mixture.....	12.00	....	4.00
Johnston County Bone and Potash.....	10.00	....	5.00
Navassa Wheat and Grass Grower.....	10.00	....	4.00
Navassa Dissolved Bone with Potash.....	10.00	....	4.00
Navassa Wheat Mixture.....	10.00	....	2.25
Navassa Dissolved Bone with Potash.....	10.00	....	2.00
Navassa Piedmont Wheat Grower.....	10.00	....	2.00
Navassa Dissolved Bone with Potash.....	10.00	....	6.00
Maxim Guano	10.00	2.47	2.00
Corona Guano	10.00	1.65	2.00
Navassa Fish Guano.....	9.00	2.47	3.00
Robeson County Special (C. S. M.).....	9.00	2.47	3.00
John's Fish Guano.....	8.00	2.47	4.00
Navassa Manipulated Guano.....	9.00	2.26	2.00
Navassa Special Wheat Mixture.....	12.00	....	4.00
Navassa Creole Guano.....	6.00	4.11	7.00
Navassa Special for Tobacco.....	6.00	3.29	7.00
Navassa High Grade Top Dresser.....	4.00	7.81	4.00
Navassa Top Dresser.....	4.00	6.17	2.50
Navassa Quick Results Top Dresser.....	4.00	4.94	2.50
Navassa Special Top Dresser.....	2.00	5.76	2.50
Navassa Big Lick Top Dresser.....	....	7.40	3.00
Thomas Phosphate	17.00	T. P. A.	
Pure Raw Bone .....	....	3.71	....
Sulphate of Ammonia.....	....	20.56	....
Nitrate of Soda .....	....	14.81	....
Blood .....	....	13.16	....
Fish Scrap .....	....	9.05	....
High Grade Tankage.....	....	8.23	....
Cotton Seed Meal.....	....	6.17	....
Muriate of Potash.....	....	....	48.00
Sulphate of Potash.....	....	....	48.00
Genuine German Kainit.....	....	....	12.00
Navassa Big Boll Special (C. S. M.).....	9.00	2.26	2.00
Osceola Guano	9.00	1.65	3.00
Cape Fear Meal Mixture.....	9.00	1.65	3.00
Harvest Queen Fertilizer.....	9.00	1.65	2.00
Navassa Complete Fertilizer.....	9.00	1.65	1.00
Long's Wheat and Grain Guano.....	9.00	.82	3.00
Navassa Dissolved Bone with Potash.....	8.00	....	4.00
Farmer's Mixture C. S. M.....	8 $\frac{3}{4}$	1.85	4.00
Navassa Universal Fertilizer.....	8 $\frac{1}{2}$	2.06	1.00
Enterprise Strawberry Grower.....	8.00	3.29	11.00
Navassa Special Meal Fertilizer.....	8.00	3.29	4.00
Coree Tobacco Guano.....	8.00	3.29	4.00
Navassa High Grade Fertilizer.....	8.00	3.29	4.00
Navassa Special Truck Guano.....	8.00	3.29	4.00
Navassa Carib Guano.....	8.00	2.47	10.00
Navassa Complete Tobacco Mixture.....	8.00	2.47	10.00
Navassa Standard Tobacco Guano.....	8.00	2.47	7.00
Navassa Blood and Meal Mixture.....	8.00	2.47	5.00
Maultsby's Tobacco Guano.....	8.00	2.47	5.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Navassa Big Cotton Grower C. S. M.....	8.00	2.47	4.00
Orton Guano	8.00	2.47	4.00
Navassa High Grade Guano.....	8.00	2.47	3.00
Clarendon Tobacco Guano.....	8.00	2.47	3.00
Navassa Standard Meal Guano.....	8.00	2.47	3.00
Navassa Carolina Tobacco Grower.....	8.00	2.47	3.00
Navassa Cotton Seed Meal Special 3 per cent Guano.....	8.00	2.47	2.00
Navassa Strawberry Top Dressing.....	8.00	2.06	4.00
Sullivan's Tobacco Special.....	8.00	2.06	3.00
Mogul Guano	8.00	2.06	3.00
Maultsby's Meal Mixture.....	8.00	2.06	3.00
Navassa Guano for Tobacco.....	8.00	2.06	2.00
Ammoniated Soluble Navassa Guano.....	8.00	2.06	2.00
Brook's Ammoniated Guano.....	8.00	2.06	1½
Navassa Fruit Growers Fertilizer.....	8.00	1.65	6.00
Harvest King Guano.....	8.00	1.65	3.00
Clark's Special Cotton Seed Meal Guano.....	8.00	1.65	3.00
Navassa Grain Fertilizer.....	8.00	1.65	2.00
Navassa Cotton Fertilizer.....	8.00	1.65	2.00
Navassa Cotton Seed Meal Guano.....	8.00	1.65	2.00
Occoneechee Tobacco Guano	8.00	1.65	2.00
Navassa Lettuce Grower Fertilizer.....	7.00	5.76	7.00
Maultsby's Tobacco Special	7.00	4.11	10.00
Navassa Root Crop Fertilizer.....	7.00	4.11	7.00
Navassa Premium Meal Guano.....	7.00	3.29	5.00
Navassa Standard Top Dresser	4.00	8.23	3.00
Navassa Wheat Fertilizer	9.00	.82	2.00
Navassa No-Potash Guano	10.00	1.65	....
Navassa Wheat Belt Guano	10.00	.82	1.00
Navassa No-Potash Wheat Fertilizer	11.00	.82	....
Navassa High Grade Ammo. Superphosphate.....	12.00	2.47	....
Navassa Standard Ammo. Superphosphate	12.00	1.65	....
Navassa Ammoniated Superphosphate	12.00	.82	....
Navassa High Grade Ammo. Superphosphate.....	10.00	3.29	....
Navassa Standard Ammo. Superphosphate.....	10.00	2.47	....
Navassa Ammo. Superphosphate	10.00	1.65	....
Navassa Standard Ammo. Superphosphate.....	9.00	2.47	....
Navassa High Grade Ammo. Superphosphate.....	8.00	3.29	....
Navassa Crown Guano	4.00	3.29	4.00
Navassa Champion Top Dresser .....	....	7.40	2.00
Navassa Manipulated Guano, Revised.....	9.00	2.26	1.00
Navassa C. S. M. Special Guano, Revised.....	8.00	2.47	1.00
Navassa Special Meal Fertilizer, Revised	8.00	3.29	1.00
Coree Tobacco Guano, Revised	8.00	3.29	2.00
Clarendon Tobacco Guano, Revised.....	8.00	2.47	2.00
Navassa Root Crop Fertilizer, Revised	7.00	4.11	2.00
Navassa High Grade Ammo. Superphosphate.....	14.00	4.11	....
Navassa Special Truck Guano, Revised.....	8.00	3.29	2.00
Navassa High Grade Ammo. Superphosphate.....	7.00	4.94	....
Navassa Ammoniated Superphosphate	6.00	3.29	....
Navassa Ammoniated Superphosphate	11.00	.82	....
Navassa Ammoniated Superphosphate	4.00	6.17	....
Navassa Ammoniated Superphosphate	6.00	4.11	....
Navassa Ammoniated Superphosphate	4.00	6.58	....
Navassa Ammoniated Superphosphate	4.00	8.23	....
Navassa Ammoniated Superphosphate	5.00	9.05	....
Navassa Ammoniated Superphosphate	4.00	4.94	....
Navassa Ammoniated Superphosphate	6.00	8.23	....
Ground Phosphate Rock	28.00	T.P.A.	....
Navassa Ammoniated Superphosphate	3.00	7.40	....
Wright's King Tobacco Special	8.00	1.85	2½

<i>Name of Brand</i> <i>Name of Brand</i>	<i>Available</i> <i>Phos. Acid</i> <i>Per Cent</i>	<i>Nitrogen</i> <i>Per Cent</i>	<i>Potash</i> <i>Per Cent</i>
Navassa Peanut Special	2.00	7.40	1.00
Carr's Fish Ammo. Superphosphate.....	5.00	4.11	....
Navassa Dissolved Bone with Potash	12.00	....	2.00
Navassa Dissolved Bone with Potash.....	11.00	....	1.00
Farmer's Mixture, Revised, C. S. M.	8¾	1.85	3.00
Navassa High Grade Ammoniated Superphosphate.....	12.00	4.94	....
Navassa High Grade Ammoniated Superphosphate.....	8.00	4.11	....

OLD BUCK GUANO COMPANY, INC.,

RICHMOND, VA.

<i>Name of Brand</i>	<i>Available</i> <i>Phos. Acid</i> <i>Per Cent</i>	<i>Nitrogen</i> <i>Per Cent</i>	<i>Potash</i> <i>Per Cent</i>
Old Buck Red Sultan Corn and Tobacco	9.00	1.65	1.00
Old Buck Saxon Corn and Tobacco.....	8.00	1.65	2.00
Old Buck Warsaw Guano	8.00	1.65	2.00
Old Buck Bonnie Best Tobacco.....	8.00	2.05	2.00
Old Buck High Prize Tobacco	8.00	2.05	3.00
Old Buck Western Grain Guano	8.00	1.65	3.00
Old Buck Double Potash Guano	8.00	1.65	5.00
Old Buck Tuck-a-ho Cotton	8.00	2.05	2.50
Old Buck Corn Guano	10.00	1.65	4.00
Old Buck Hanover Cotton Guano	10.00	1.65	2.00
Old Buck Iron Man Guano	10.00	1.65	1.00
Old Buck Minorea Guano	9.00	1.65	1.00
Old Buck Clarke's Wheat Formula	9.00	1.65	1.00
Old Buck Peanut Special	9.00	1.65	3.00
Old Buck Advancer Tobacco	9.00	2.26	2.00
Old Buck Mount Koster Cotton Guano.....	9.00	2.26	1.00
Old Buck Clifton Cotton Guano.....	9.00	2.26	2.00
Old Buck Quincy Tobacco and Garden	8.00	2.47	3.00
Old Buck Guide Post Cotton Guano.....	8.00	2.47	3.00
Old Buck Wortham's Tobacco	8.00	2.47	2.00
Old Buck Dundee Tobacco	8.00	2.47	1.00
Old Buck Romanceke Guano	8.00	2.47	1.00
Old Buck Polly Anna Guano	10.00	2.47	1.00
Old Buck Chester Guano	9.00	2.47	3.00
Old Buck Test Farm Tobacco.....	8.00	2.47	4.00
Old Buck Special Grain	7.00	2.47	2.00
Old Buck Savoy Guano	10.00	.82	1.00
Old Buck Grain and Grass	10.00	.82	1.00
Old Buck MacNye's Wheat Formula	8.00	.82	3.00
Old Buck Harvest Boy	9.00	.82	2.00
Old Buck Deep Run Corn and Wheat.....	8.00	1.02	4.00
Old Buck James River Peanut and Corn.....	9.00	1.00	3.00
Old Buck Blue Rock Guano	8.00	3.30	1.00
Old Buck Dunlop's Tobacco	8.00	3.30	2.00
Old Buck Tobacco Special	8.00	3.30	4.00
Old Buck English Tobacco, Potato and Truck.....	10.00	3.30	6.00
Old Buck Florida, General Trucker.....	8.00	3.30	4.00
Old Buck State Fair Potato.....	8.00	3.30	8.00
Old Buck Better Than Bone	9.00	3.71	3.00
Old Buck C. P. Trucker.....	8.00	4.11	5.00
Old Buck Triple Best Guano.....	8.00	4.11	7.00
Old Buck Long Island Calbage, Potato, Onion.....	8.00	4.94	6.00
Old Buck Southside Trucker	7.00	4.94	5.00
Old Buck Carolina Berry and Truck.....	7.00	5.76	10.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Old Buck Water Soluble Top Dresser.....	4.00	8.23	2.00
Old Buck Top Dresser	4.00	8.23	....
Old Buck Ammoniated Phosphate	10.00	1.65	....
Old Buck Nitrogen and Acid Phos	10.00	2.47	....
Old Buck Hartford Bone and Potash.....	10.00	....	2.00
Old Buck German 10 and 4 Mixture	10.00	....	4.00
Old Buck Phospho-Alkali	10.00	....	6.00
Old Buck Bristol Alkaline Bone	12.00	....	5.00
Old Buck Gray's Mixture	14.00	....	2.00
Old Buck High Phosphate and Potash.....	12.00	....	2.00
Old Buck Elko	10.00	....	3.00
Old Buck 16 Per Cent Acid Phosphate.....	16.00	....	....
Old Buck 14 Per Cent Acid Phosphate.....	14.00	....	....
Old Buck 13 Per Cent Acid Phosphate.....	13.00	....	....
Old Buck 12 Per Cent Acid Phosphate.....	12.00	....	....
Old Buck Nitrate of Soda.....	....	15.22	....
Old Buck Ground Raw Bone.....	21.50	3.70	....
Old Buck Ammoniated Superphosphate	12.00	1.65	....
Old Buck Double Ammonia	10.00	3.30	....
Old Buck 4 Per Cent Compound.....	8.00	3.30	....
Old Buck 5 Per Cent Manure	8.00	4.11	....
Old Buck Saxon Tobacco	8.00	1.65	2.00
Old Buck Formula 29 for Tobacco.....	9.00	2.47	3.00
Old Buck 6-4-0 Mixture	6.00	3.30	....
Old Buck Nine Three	9.00	2.47	....
Old Buck Fish Scrap	4.00	8.22	....
Old Buck Cotton Seed Meal.....	....	6.15	....

G. OBER & SONS CO.,

BALTIMORE, MD.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Ober's High Grade Acid Phosphate.....	16.00	....	....
Ober's Dissolved Bone Phosphate	14.00	....	....
Ober's Dissolved Animal Bone	10.00	2.47	....
Ober's Superior Truck and Potato Compound.....	7.00	4.12	3.00
Ober's Golden Seal Tobacco Guano.....	8.00	2.47	1.00
Ober's Fruit and Vine Truck Guano.....	7.00	4.12	1.00
Ober's Royal Crown Tobacco Guano.....	8.00	2.47	3.00
Ober's Spear Head Tobacco Guano.....	8.00	2.47	2.00
Ober's Standard Fish Guano	10.00	1.65	1.00
Ober's Red Indian Tobacco Guano	10.00	1.65	1.00
Ober's Gem Ammoniated Phosphate	11.00	2.47	....
Ober's Climax Ammoniated Compound	12.00	1.65	....
Cooper's Pungo Guano for All Crops.....	8.00	2.06	2.00
Ober's Special Cotton Compound	8.00	1.65	2.00
Ober's Cotton States Guano	10.00	1.65	1.00
Ober's Special Tobacco Bed Fertilizer.....	4.00	8.25	....
Ober's Ideal Vegetable Compound	8.00	3.30	....
Ober's Fish Bone Mixture	9.00	2.47	....
Ober's Sun Beam Guano	10.00	1.65	....
Ober's Farmer's Mixture	9.00	.82	2.00
Ober's Standard Tobacco Fertilizer	8.00	1.65	2.00
Pure Raw Bone Meal	21.00	3.71	....
Ober's Red King Guano	8.00	2.47	1.00
Ober's Peerless Top Dresser .....	....	8.25	1.00

PAMLICO CHEMICAL COMPANY, Inc.,

WASHINGTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Pamlico Royal Tobacco Guano.....	8.00	3.30	2.00
Pamlico Prosperity Tobacco Guano.....	8.00	2.47	2.00
Pamlico Perfection Tobacco Guano.....	8.00	2.47	2.00
Pamlico Bone and Fish Guano.....	8.00	1.65	2.00
Pamlico Meal Mixture	9.00	2.26	2.00
Pamlico Crop Delight Guano.....	8.00	3.30	1.00
Pamlico Surety Crop Grower.....	8.00	2.47	1.00
Pamlico Profuse Crop Grower.....	10.00	2.47	1.00
Old North State Guano.....	9.00	1.65	1.00
Pamlico Fish Compound	6.00	3.30	....
Pamlico Acid Fish Mixture	8.00	3.30	....
Pamlico Cotton Producer	10.00	3.30	....
Pamlico Rank Guano	9.00	2.47	....
Pamlico Cabbage Guano	5.00	8.22	....
Pamlico Potato Guano	7.00	4.12	2.00
Pamlico Tip Top Potato Guano.....	8.00	4.12	....
Pamlico Ammoniated Truck Guano.....	7.00	5.76	....
Cowell's Special Potato Guano.....	7.00	4.12	3.00
Pamlico Ground Fish .....	....	8.22	....
Pamlico Cotton Seed Meal.....	....	6.17	....
Pamlico Nitrate of Soda.....	....	15.22	....
Pamlico High Grade Acid Phosphate	16.00	....	....
Bull's Eye Tobacco Guano.....	8.00	3.30	4.00
Tobacco Grower's Friend Guano.....	8.00	2.47	3.00
Pamlico Fish Mixture for Tobacco.....	8.00	2.47	3.00
Pamlico Fish Mixture for Cotton.....	8.00	2.47	3.00
Pamlico Blood Mixture for Tobacco	8.00	2.47	3.00
Pamlico High Grade Tobacco Grower.....	8.00	2.47	5.00
Pamlico Sweet Potato Guano.....	8.00	2.47	3.00
Quick Grower Guano	8.00	2.06	3.00
Rust Proof Cotton Guano.....	8.00	1.65	3.00
Martin County Peanut Guano.....	10.00	1.23	4.00
Pamlico Favorite Potato Guano.....	7.00	4.12	5.00
Pamlico High Grade Truck Guano.....	7.00	4.12	5.00
Pamlico Special Irish Potato Guano.....	7.00	4.12	7.00
Early Sweet Potato Guano.....	8.00	2.47	10.00
Pamlico Special Sweet Potato Guano.....	8.00	2.47	5.00
Cowell's Great Cabbage Grower.....	5.00	8.22	2.50
Pamlico Quick Step Top Dresser.....	....	8.22	4.00
Pamlico Cereal Top Dresser .....	....	7.41	3.00
Pamlico Nitro Top Dresser	4.00	8.22	....
Pamlico Essential Wheat Maker.....	10.00	1.65	1.00
Pamlico Grain Producer	9.00	.82	2.00
Pamlico Wheat Grower's Friend.....	9.00	1.65	2.00
Pamlico Half and Half Guano.....	8.00	2.88	.75
Blue's Special Truck Guano.....	6.00	4.12	2.00
Pamlico 10-2-0 Guano	10.00	1.65	....
Pamlico Irish Cobbler Guano.....	7.00	4.12	1.00
Pamlico 9-2 3/4-1 Guano	9.00	2.26	1.00
Pamlico Bone and Fish Guano for Tobacco.....	8.00	1.65	2.00
Pamlico Trucker's Special Guano	8.00	5.76	....
Pamlico Acid Meal Mixture	8.00	2.88	.75
Pamlico Early Truck Guano.....	7.00	4.94	....
Pamlico Special Mixture	6.00	3.30	2.00
Pamlico 8-4-3 Guano	8.00	3.30	3.00

A. F. PRINGLE,
CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>B. P. L.</i>	<i>Nitrogen</i>
Tankage .....	.....	10.00	4.94
Castor Bean Meal .....	.....	4.00	5.76
Acid Phosphate	16.00	.....	.....

PHOSPHATE MINING COMPANY,
SAVANNAH, GA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
"Superfine" Acid Phosphate	16.00	.....	.....

PHILLIPS FERTILIZER COMPANY,
WASHINGTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Phillips' High Grade 16 Per Cent Acid Phosphate.....	16.00	.....	.....
Phillips' Cotton and Corn Guano.....	10.00	2.47	.....
Phillips' High Grade Tobacco Guano 3-8-2.....	8.00	2.47	2.00
Hustler 3-8-1 Guano for All Crops.....	8.00	2.47	1.00
Phillips' Truck Guano for All Vegetables.....	6.00	3.29	2.00
Phillips' Double Quick Side Dresser.....	4.00	8.23	.....
Cotton Seed Meal, 7½ Per Cent Ammonia .....	.....	6.17	.....
Cyanamid, 18 Per Cent Ammonia .....	.....	14.81	.....
Fish Scrap .....	.....	9.87	.....
Fish Scrap .....	.....	8.23	.....
Nitrate of Soda .....	.....	15.22	.....
Animal Tankage .....	.....	9.05	.....

PINE LEVEL OIL MILL COMPANY,
PINE LEVEL, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Oliver's Truck Grower Guano No. 2.....	8.00	3.30	1.00
Pine Level High Grade Guano No. 3.....	8.00	2.47	.60
Pine Level Prolific Guano	9.00	2.26	2.00
Argo Guano	6.00	3.30	.50
Winston's Special Guano	8.00	3.30	.....
Panacea Guano	8.00	3.30	.....
Oasis Guano	9.00	2.47	.....
Nonpareil Guano	6.00	3.30	.....
Sand Hill Special Guano.....	7.00	4.11	.....
Pine Level 16 Per Cent Acid Phosphate.....	16.00	.....	.....
Nitrate of Soda .....	.....	14.88	.....

PEARSALL & CO.,

WILMINGTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Pearsall's Two-Step Guano	8.00	1.65	2.00
Pearsall's Useme Guano	8.00	2.47	2.00
Pearsall's High Grade Tobacco Guano.....	8.00	2.47	3.00
Pearsall's FFFG Guano	8.00	2.47	1.00
Pearsall's Bone, Meal and Fish Guano.....	8.00	3.30	....
Pearsall's Animal Tankage Mixture.....	6.00	3.30	....
Pearsall's Farmside Special Guano.....	9.00	2.47	....
Pearsall's Ten Two Mixture.....	10.00	1.65	....
Pearsall's Ten Four Mixture	10.00	3.30	....
Pearsall's High Grade 16 Per Cent Acid Phosphate.....	16.00	....	....
Pearsall's 14 Per Cent Acid Phosphate.....	14.00	....	....
Pearsall's Nitrate of Soda .....	....	14.85	....
Pearsall's Bone Meal	20.00	3.30	....
Pearsall's Fish Scrap	5.00	8.22	....
Braswell's Potash Guano	8.00	2.47	5.00

PIEDMONT MOUNT AIRY GUANO COMPANY,

BALTIMORE, Md.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Piedmont Fish Guano	10.00	1.65	....
Piedmont Special for Cotton, Corn and Peanuts.....	10.00	1.65	....
Piedmont Special Fertilizer	8.00	3.29	....
Piedmont Challenge Fertilizer	8.00	4.12	....
Piedmont Special Potato Guano	8.00	5.76	....
10 Per Cent Fish Guano.....	....	8.23	....
Piedmont 16 Per Cent Acid Phosphate.....	16.00	....	....
Piedmont Cultivator Brand	10.00	1.65	....
Piedmont High Grade Ammoniated.....	10.00	2.47	....

PLANTER'S FERTILIZER AND PHOSPHATE COMPANY,

CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Planter's Special Mixture	8.00	3.29	....
Special Mixture	9.00	2.47	....
Special Mixture	10.00	1.65	....
Special Mixture	10.00	2.47	....
Special Mixture	11.00	1.65	....
Special Mixture	12.00	1.65	....
Special Mixture	9.00	1.65	2.00
Special Mixture	8.00	2.47	1.00
Special Mixture	4.00	6.13	1.00
Special Mixture	8.00	1.65	2.00
Special Mixture	8.00	2.47	2.00
Special Mixture	10.00	1.65	2.00
Soluble Guano	8.00	2.47	3.00
Special Mixture	8.00	.825	3.00
H. G. Top Dresser	4.00	6.13	2.50
Acid Phosphate	16.00	....	....
Planter's H. G. Acid Phosphate.....	14.00	....	....
Soluble Guano	13.00	....	....
Nitrate of Soda .....	....	14.83	....

POCAHONTAS GUANO COMPANY, Inc.,
LYNCHBURG, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Pocahontas Special Tobacco Fertilizer.....	9.00	2.47	3.00
Farmer's Favorite, Apex Brand	8.00	2.47	3.00
Yellow Tobacco Special	9.00	1.65	2.00
Standard Tobacco Guano, Old Chief Brand.....	9.00	1.65	2.00
Carrington Banner Brand Guano ?.....	8.00	1.65	2.00
1916 A-1 Brand Indian Head Fertilizer.....	9.00	2.47	1.00
1916 A-2 Brand Indian Head Fertilizer.....	8.00	2.47	1.00
1916 A-3 Brand Indian Head Fertilizer.....	9.00	1.65	1.00
1916 A-9 Brand Indian Head Fertilizer.....	8.00	2.47	2.00
1916 A-5 Brand Indian Head Fertilizer.....	10.00	1.65	....
1916 A-6 Brand Indian Head Fertilizer.....	12.00	1.65	....
1916 A-7 Brand Indian Head Fertilizer.....	10.00	2.47	....
Pure Raw Bone Meal	20.59	3.70	....
Dissolved S. C. Phosphate Rock	14.00	....	....
Carrington's S. C. Phosphate Waukesha Brand.....	16.00	....	....

PLANTER'S COTTON OIL AND FERTILIZER COMPANY,
ROCKY MOUNT, N. C.,

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Acid Phosphate	16.00	....	....
Genuine German Kainit .....	....	....	12.00
J. P. D. Special	8.00	3.29	5.00
Gorham's High Grade	8.00	3.29	4.00
Tar River Special	8.00	2.47	3.00
Planter's C. S. Oil Co.'s Tobacco Guano.....	8.00	2.47	3.00
Planter's C. S. Oil Co.'s Cotton Guano.....	8.00	1.65	2.00
Planter's Peanut Mixture	8.00	1.21	5.00
Planter's Special Potato Guano	7.00	4.12	5.00
E. L. D. Special	7.00	2.47	3.00
Braswell's Special for Tobacco.....	7.00	2.26	3.50
Planter's Top Dresser	3.50	7.82	3.00
Ground Fish Scrap .....	....	8.00	....
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	48.00
Planter's Pride for Cotton.....	8.00	1.65	2.00
Braswell's Excelsior	7.00	3.29	6.00
Royal Cotton Grower	9.00	2.26	2.00
Brake's Corn Special	8.00	1.65	7.00
Robertson's Tobacco Mixture	8.00	2.47	5.00
Nitrate of Soda .....	....	15.00	....
Thorne's Cotton King	8.00	3.29	4.00
9-4 Top Dresser .....	....	7.40	4.00
Meal and Fish Mixture No. 1.....	9.00	4.12	....
Meal and Fish Mixture No. 2.....	8.00	3.29	....
Meal and Fish Mixture No. 3.....	9.00	2.47	....

PATAPSCO GUANO COMPANY,
BALTIMORE, Md.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Patapsco Vegetable Grower, 1916.....	7.00	4.11	1.00
Patapsco Tobacco Fertilizer, 1916.....	9.00	2.47	2.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Patapseo 9-3-1 Fertilizer, 1916	9.00	2.47	1.00
Patapseo Guano	9.25	2.06	2.00
Patapseo Bright Tobacco Grower, 1916.....	9.00	1.65	2.00
Patapseo Gold Leaf Cotton Seed Meal Mixture, 1916.....	9.00	2.26	2.00
Patapseo General Crop Producer.....	9.00	1.65	1.00
Patapseo High Grade Tobacco Special, 1916.....	8.00	2.47	2.00
Choctaw Guano, 1916	8.00	2.47	1.00
Planter's Favorite	8.00	1.65	2.00
Sea Gull Ammoniated Guano	8.00	1.65	2.00
Coon Brand Guano, 1916.....	10.00	.82	1.00
Chippewa Guano	8.00	2.47	3.00
Possum Brand Guano, 1917	11.00	.82	....
Patapseo Golden Opportunity Mixture	10.00	3.29	....
Patapseo 8-4-0 Fertilizer	8.00	3.29	....
Patapseo 9-3-0 Fertilizer	9.00	2.47	....
Old North State Mixture	6.00	3.29	....
Patapseo Golden Crop Fertilizer.....	10.00	1.65	....
Florida Soluble Phosphate	16.00	....	....
Patapseo Pure Dissolved S. C. Phosphate.....	14.00	....	....
Battle Ax Phosphate	12.00	....	....
Patapseo Trucker for Early Vegetables.....	7.00	4.11	5.00
Unicorn Guano	8.00	2.06	3.00
Grange Mixture, 1917	8.00	1.65	2.00
Baltimore Soluble Phosphate	11.00	....	2.00
Patapseo Pure Raw Bone (Total).....	21.51	3.70	....
Nitrate of Soda .....	....	15.00	....
Dry Ground Fish (Total).....	6.00	8.23	....

PERUVIAN GUANO CORPORATION,

CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Peruvian's Truck Formula	7.00	6.58	5.00
Peruvian's Tobacco Mixture	7.00	4.11	5.00
Peruvian's Tobacco Special	8.00	1.65	4.00
Peruvian's 824 Mixture	8.00	1.65	4.00
Sea Island Peruvian Mixture.....	9.00	2.47	3.00
Lobos Peruvian Mixture	8.00	2.47	3.00
Peruvian's Corn Special	8.00	1.65	3.00
Excelsior Peruvian Formula	8.00	.82	3.00
Peruvian's Special Tobacco Mixture	7.00	4.11	3.00
Peruvian's Acid Phosphate Mixture	10.00	....	2.00
Peruvian's Kotton King	9.00	1.74	2.00
Peruvian's High Grade Potash Mixture.....	7.00	4.11	2.00
Peruvian's Special Tobacco Producer	9.00	3.29	2.00
Peruvian's Bumper Crop Grower	8.00	2.47	2.00
Peruvian's Cotton Producer	8.00	1.65	2.00
Standard Peruvian Mixture	8.00	1.65	2.00
Peruvian's Acid Potash Mixture	12.00	....	1.00
Peruvian's 931 Mixture	9.00	2.47	1.00
Peruvian's 921 Mixture	9.00	1.65	1.00
Peruvian's Corn and Cotton Special.....	8.00	3.29	1.00
Peruvian's Standard Mixture	8.00	2.47	1.00
Peruvian's Vegetable Grower	7.00	6.58	1.00
Peruvian's H. G. Top Dresser No. 2	5.00	6.99	1.00
Peruvian's Ammoniated Superphosphate	12.00	1.65	....
Peruvian's H. G. Ammoniated Superphosphate.....	12.00	2.47	....
Peruvian's Standard Ammoniated Superphosphate	11.00	2.47	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Peruvian's Special Ammoniated Superphosphate	10.00	2.47	....
Peruvian's Bellastas Ammoniated Superphosphate.....	10.00	1.65	....
Peruvian's Excelsior Ammoniated Superphosphate	9.00	2.47	....
Peruvian Compound (Total A. P.).....	13.00	4.64	2.00
Genuine Peruvian Guano	11.00	10.28	2.25
Peruvian's 852 Mixture	8.00	4.11	2.00
Peruvian Compound No. 2.....	6.00	5.15	2.50
Peruvian Potato Formula	7.00	4.11	2.00
Peruvian 860 Mixture	8.00	4.94	....
Peruvian's High Grade Top Dresser.....	8.00	6.99	....
Peruvian's 650 Mixture	6.00	4.11	....
Peruvian's Special Top Dresser.....	4.00	6.17	....
Peruvian's Ultra Top Dresser	5.00	8.23	....
Peruvian's 750 Mixture	7.00	4.11	....
Peruvian's Acid Phosphate	14.00	....	....
Peruvian's H. G. Acid Phosphate	16.00	....	....

POWHATAN CHEMICAL COMPANY,

RICHMOND, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Magic Truck Special	7.00	4.11	1.00
Powhatan Tobacco Special	9.00	3.29	1.00
North State Tobacco Special	8.00	3.29	1.00
North State Cotton Special.....	8.00	3.29	1.00
Special Fertilizer	9.00	2.47	1.00
Hustler Tobacco Special	8.00	2.47	1.00
Special Tobacco Fertilizer	9.00	2.47	2.00
Special Tobacco Fertilizer	8.00	2.47	2.00
P. C. Co.'s Special Fertilizer	8.00	2.47	1.00
White Leaf Tobacco Special	9.00	2.06	1.00
King Cotton Special	9.00	2.06	1.00
Magic Tobacco Special	9.00	1.65	1.00
Magic Mixture	9.00	1.65	1.00
Magic Tobacco Grower	8.00	1.65	2.00
Magic Cotton Grower	8.00	1.65	2.00
Magic Cotton Special	9.00	1.65	1.00
Powhatan Corn Special	12.00	1.00	1.00
Magic Corn Grower	10.00	.82	1.00
Magic Crop Grower	10.00	.82	1.00
Magic Ammoniated Phosphate 10-4-0.....	10.00	3.29	....
Magic Ammoniated Phosphate 9-4-0.....	9.00	3.29	....
Magic Ammoniated Phosphate 10-3-0.....	10.00	2.47	....
Magic Ammoniated Phosphate 10-2 ½-0.....	10.00	2.06	....
Magic Ammoniated Phosphate 12-2-0.....	12.00	1.65	....
Magic Ammoniated Phosphate 9 ½-2 ½-0.....	9.50	2.06	....
Hustler Guano	9.00	2.47	....
North State Guano	8.00	3.29	....
Magic Guano	10.00	1.65	....
Powhatan Corn Guano	12.00	1.00	....
Magic Crop Guano	11.00	.82	....
Magic Dissolved Bone Phosphate.....	16.00	....	....
High Grade Acid Phosphate.....	14.00	....	....
Powhatan Acid Phosphate	13.00	....	....
Virginia Dissolved Bone	12.00	....	....
Nitrate of Soda .....	....	14.80	....
Sulphate of Ammonia .....	....	19.75	....
Powhatan Top Dresser	4.00	8.23	4.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Magic Top Dresser	4.00	6.17	2.50
Powhatan Trucker	7.00	4.94	5.00
King Trucker	8.00	4.11	5.00
Tomlinson's Best Fertilizer	8.00	3.70	7.00
Copeland's Magic Fertilizer	8.00	3.29	8.00
Copeland's Special Fertilizer	6.00	3.29	7.00
Powhatan Special Fertilizer	8.00	3.29	6.00
North State Special	8.00	3.29	4.00
Tomlinson's Favorite Fertilizer	8.00	2.88	5.00
Copeland's Best Fertilizer	7.00	2.88	7.00
Tomlinson's Magic Fertilizer	8.00	2.47	7.00
Tomlinson's Special Fertilizer	8.00	2.47	5.00
Austin's Special Fertilizer	9.00	2.47	6.00
Guilford's Special Tobacco Fertilizer.....	9.00	2.47	6.00
Magic Fertilizer	8.00	2.47	4.00
P. C. Co.'s Hustler	8.00	2.47	3.00
P. C. Co.'s Hustler Tobacco Guano.....	8.00	2.47	3.00
Ralling's Special Fertilizer	9.00	2.47	2.00
Johnson's Special Fertilizer	8.00	2.47	3.00
Economic Cotton Grower	9.00	2.26	2.00
Johuson's Best Fertilizer	9.00	2.06	5.00
Holt's Magic Fertilizer	9.00	2.06	5.00
White Leaf Tobacco Fertilizer	8.00	2.06	3.00
King Brand Fertilizer	8.00	2.06	3.00
Union Magic Fertilizer	9.00	1.85	4.00
Powhatan Peanut Fertilizer	8.00	1.65	4.00
North Carolina Favorite	9.00	1.65	3.00
Magic Special Fertilizer	8.00	1.65	2.00
Powhatan Special Fertilizer	9.00	1.65	2.00
Allen's Special Tobacco Fertilizer.....	6.00	1.65	5.00
Magic Wheat Grower	9.00	.82	2.00
Magic Corn Special Fertilizer.....	12.00	1.00	2.00
Magic Wheat Special	12.00	1.00	2.00
Magic Peanut Special	8.00	.82	4.00
Magic Grain Special	8.00	.82	4.00
Powhatan Grain Guano	9.00	.82	3.00
High Grade Bone and Potash Mixture.....	12.00	....	5.00
Magic Bone and Potash Mixture.....	10.00	....	4.00
Bone and Potash Mixture.....	14.00	....	2.00
Magic Grain and Grass Grower.....	8.00	....	4.00
Magic Peanut Grower	8.00	....	4.00
Powhatan Bone and Potash Mixture.....	8.00	....	4.00
Bone and Potash Mixture.....	10.00	....	2.00
Bone and Potash Mixture.....	12.00	....	2.00
Bone and Potash Mixture.....	11.00	....	1.00
Pure Raw Bone Meal.....	22.50	3.70	....
Pure Animal Bone	25.00	2.47	....
Special Fertilizer	8.00	3.29	2.00

POCOMOKE GUANO COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Peerless Acid Phosphate	14.00	....	....
Superb Acid Phosphate	16.00	....	....
Alkali Bone	11.00	....	2.00
Electric Crop Grower	9.00	1.65	2.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
C. C. C. Crescent Complete Compound.....	8.00	1.65	3.00
Cinco Tobacco Guano	8.50	2.06	2.50
Monarch Tobacco Grower	8.00	2.47	3.00
Harvey's High Grade Monarch.....	8.00	2.47	3.00
Pocomoke Sweet Potato Grower.....	8.00	2.47	3.00
Standard Truck Guano	7.00	4.11	5.00
Pocomoke Truck Grower, 5 Per Cent.....	7.00	4.11	5.00
Seaboard Popular Trucker	6.00	5.76	5.00
Freeman's 7 Per Cent Irish Potato Grower.....	6.00	5.76	5.00
Coast Line Truck Guano.....	5.00	8.23	3.00
Faultless Ammoniated Superphosphate	8.00	3.29	4.00
Pocomoke Defiance Bone and Potash.....	8.00	....	4.00
Monticello Animal Bone Fertilizer.....	9.00	1.85	4.00
Garrett's Grape Grower	8.00	3.29	10.00
Pocomoke 1-11-0 Fertilizer	11.00	.82	....
Pocomoke 1-10-1 Fertilizer	10.00	.82	1.00
Pocomoke 2-10-0 Fertilizer	10.00	1.65	....
Pocomoke 2-11-0 Fertilizer	11.00	1.65	....
Pocomoke 2-12-0 Fertilizer	12.00	1.65	....
Pocomoke 2-10-1 Fertilizer	10.00	1.65	1.00
Pocomoke Guano	8.00	1.65	2.00
Pocomoke Tobacco Gnano	8.00	1.65	2.00
Monticello Animal Bone Special.....	9.00	1.85	2.00
Pocomoke 2½-10-1 Fertilizer	10.00	2.06	1.00
Pocomoke 3-9-0 Fertilizer	9.00	2.47	....
Pocomoke 3-8-1 Fertilizer	8.00	2.47	1.00
Pocomoke 2¼ 9-1	9.00	1.85	1.00
Monarch Tobacco Special	8.00	2.47	2.00
Pocomoke 3-9-1 Fertilizer	9.00	2.47	1.00
Pocomoke 3-9-2 Fertilizer	9.00	2.47	2.00
Pocomoke 3-10-0 Fertilizer	10.00	2.47	....
Pocomoke 4-8-0 Fertilizer	8.00	3.29	....
Pocomoke 4-8-1 Fertilizer	8.00	3.29	1.00
Pocomoke 4-8-2 Fertilizer	8.00	3.29	2.00
Pocomoke 4-10-0 Fertilizer	10.00	3.29	....
Pocomoke 5-8-0 Fertilizer	8.00	4.11	....
Pocomoke 5-7-0 Fertilizer	7.00	4.11	....
Pocomoke 5-7-1 Fertilizer	7.00	4.11	1.00
Pocomoke 5-7-2 Fertilizer	7.00	4.11	2.00
Pocomoke 7-6-0 Fertilizer	6.00	5.76	....
Pocomoke 7-6-2 Fertilizer	6.00	5.76	2.00
Pocomoke 7-8-0 Fertilizer	8.00	5.76	....
Pocomoke 7-8-1 Fertilizer	8.00	5.76	1.00
Pocomoke 7-8-2 Fertilizer	8.00	5.76	2.00
Pocomoke 7-6-1 Fertilizer	6.00	5.76	1.00
Pocomoke 10-5-0 Fertilizer	5.00	8.23	....
Pocomoke 10-5-1 Fertilizer	5.00	8.23	1.00
Pocomoke 10-5-2 Fertilizer	5.00	8.23	2.00
Pocomoke 9-3-0 Top Dresser	3.00	7.41	....
Pocomoke 9-4-0 Top Dresser	4.00	7.41	....
Pocomoke 10-5-0 Top Dresser	5.00	8.23	....
Pocomoke 10-5-1 Top Dresser	5.00	8.23	1.00
Pocomoke 10-4-2 Top Dresser	4.00	8.23	2.00
Pocomoke 2-9-1 Fertilizer	9.00	1.65	1.00
Pocomoke 4-6-0 Fertilizer	6.00	3.29	....
Nitrate of Soda .....	....	15.00	....
Exum's Fish and Meal Mixture.....	10.00	3.29	....
Pocomoke 5-10-0 Fertilizer	10.00	4.11	....
Dry Ground Fish .....	....	8.23	....
Pocomoke 2¼-9-1	9.00	1.85	1.00

PAMLICO CHEMICAL COMPANY, INC.,
WASHINGTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Pamlico 8-4-3 Guano	8.00	3.30	3.00

F. S. ROYSTER GUANO COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Royster's High Grade 17 Per Cent Acid Phosphate.....	17.00	....	....
Royster's High Grade 16 Per Cent Acid Phosphate.....	16.00	....	....
Royster's 14 Per Cent Acid Phosphate.....	14.00	....	....
Royster's Dissolved Bone	13.00	....	....
Royster's XX Acid Phosphate	12.00	....	....
Royster's Volley Brand Ammoniated Phosphate	12.00	1.65	....
Royster's 12 and 5 Bone and Potash Mixture.....	12.00	....	5.00
Royster's 12 and 2 Bone and Potash Mixture.....	12.00	....	2.00
Royster's Target Ammoniated Phosphate	11.00	2.47	....
Royster's 11 and 5 Bone and Potash Mixture.....	11.00	....	5.00
Royster's 11 and 1 Bone and Potash Mixture.....	11.00	....	1.00
Royster's Bee Line Special Truck Compound.....	10.00	4.94	....
Royster's Landmark Ammoniated Phosphate	10.00	3.30	....
Royster's Kingfish High Grade Fertilizer.....	10.00	2.47	3.00
Royster's Log Cabin Fertilizer	10.00	2.47	1.00
Royster's Puritan Meal Mixture	10.00	2.47	1.00
Royster's Gazelle Ammoniated Phosphate	10.00	2.47	....
Royster's Soluble Guano	10.00	1.65	2.00
Royster's Ovation Brand Ammoniated Phosphate.....	10.00	1.65	....
Royster's Haywood Special Guano	10.00	.82	3.00
Royster's Hoe Cake Fertilizer	10.00	.82	1.00
Royster's 10 and 6 Bone and Potash Mixture.....	10.00	....	6.00
Royster's 10 and 5 Bone and Potash Mixture.....	10.00	....	5.00
Royster's 10 and 4 Bone and Potash Mixture.....	10.00	....	4.00
Royster's Bone and Potash for Grain.....	10.00	....	3.00
Royster's Bone and Potash Mixture	10.00	....	2.00
Royster's Surry Special Tobacco Grower	9.00	2.47	3.00
Royster's Piedmont Special Cotton Grower	9.00	2.47	3.00
Pilot Mountain Special Tobacco Guano.....	9.00	2.47	2.00
Royster's Simplex Ammoniated Phosphate	9.00	2.47	....
Royster's Mexo Ammoniated Guano	9.00	2.26	2.00
Royster's Cotton Grower	9.00	2.26	2.00
Royster's Meal Mixture	9.00	2.26	2.00
Royster's Emergency Meal Mixture	9.00	2.26	1.00
Royster's Viking Ammoniated Guano	9.00	1.65	3.00
Royster's Honey Bee Special Compound.....	9.00	1.65	1.00
Royster's Grain Guano	9.00	.82	3.00
Royster's Bison Special Fertilizer	9.00	.82	2.00
Royster's Alaska 7 Per Cent Ammoniated Phosphate.....	8.00	5.76	....
Royster's Touraine Tobacco Fertilizer.....	8.00	4.11	7.00
Royster's Angelus Compound	8.00	4.11	3.00
Royster's Gothic Truck Compound	8.00	4.11	1.00
Royster's Apollo Special Truck	8.00	4.11	....
Royster's Nectar Special Fertilizer	8.00	3.30	6.00
Cobb's High Grade for Tobacco.....	8.00	3.30	5.00
Cobb's High Grade for Cotton.....	8.00	3.30	5.00
Royster's Ibex Sweet Potato Grower.....	8.00	3.30	5.00
Royster's Trucker's Delight	8.00	3.30	4.00
Royster's Milo Tobacco Guano	8.00	3.30	4.00
Royster's High Grade Special Tobacco Guano	8.00	3.30	4.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Royser's Jupiter High Grade Guano.....	8.00	3.30	4.00
Royser's Mustang Special Guano	8.00	3.30	3.00
Royser's Gorham's Special	8.00	3.30	2.50
Royser's Big Bet Tobacco Guano.....	8.00	3.30	2.00
Royser's Sensation Fertilizer	8.00	3.30	1.00
Royser's Defender Ammoniated Phosphate	8.00	3.30	....
Royser's Polo Tobacco Guano	8.00	2.88	5.00
Royser's Lenoir Special Tobacco Guano	8.00	2.88	5.00
Royser's Eagles' Special Tobacco Guano.....	8.00	2.47	5.00
Royser's Spearhead High Grade Guano	8.00	2.47	4.00
Royser's Bonanza Tobacco Guano	8.00	2.47	3.00
Royser's Argus Cotton Guano	8.00	2.47	3.00
Royser's Marlboro H. G. Cotton Grower.....	8.00	2.47	3.00
Royser's Special Sweet Potato Grower.....	8.00	2.47	3.00
Royser's Delta Tobacco Fertilizer	8.00	2.47	2.00
Royser's Delta Ammoniated Guano	8.00	2.47	2.00
Royser's Stellar Cotton Grower	8.00	2.47	1.50
Royser's Wizard Tobacco Fertilizer	8.00	2.47	1.00
Royser's Drillwell Guano	8.00	2.47	1.00
Royser's Everlasting Meal Mixture	8.00	2.47	1.00
Royser's Orinoco Tobacco Guano	8.00	2.06	3.00
Royser's Special Tobacco Compound	8.00	2.06	2.00
Royser's Fish, Flesh and Fowl	8.00	1.65	3.00
Royser's Special Wheat Fertilizer	8.00	1.65	2.00
Royser's Complete Guano	8.00	1.65	2.00
Royser's Farmer's Bone Fertilizer	8.00	1.65	2.00
Royser's Farmer's Bone Fertilizer for Tobacco	8.00	1.65	2.00
Royser's Sambo Peanut Grower	8.00	1.03	4.00
Royser's Harvest Home Fertilizer	8.00	1.03	4.00
Royser's 8 and 4 Bone and Potash Mixture.....	8.00	....	4.00
Royser's Special 7 Per Cent Truck Guano.....	7.00	5.76	7.00
Royser's Zodiac Truck Guano	7.00	5.76	5.00
Royser's Vesta Ammoniated Phosphate	7.00	4.94	....
Royser's Early Truck Guano	7.00	4.12	8.00
Royser's Domino Potato Guano	7.00	4.12	7.00
Royser's Ripper Potato Guano	7.00	4.12	5.00
Royser's Primrose Potato Guano	7.00	4.12	3.00
Royser's Red Rover 5 Per Cent Potato Guano.....	7.00	4.12	2.00
Royser's Expo 5 Per Cent Potato Guano.....	7.00	4.12	1.00
Royser's 5 Per Cent Ammoniated Phosphate.....	7.00	4.12	....
Royser's Special Corn and Tomato Guano	7.00	1.65	5.00
Royser's Peanut Special	7.00	....	5.00
Royser's 7 and 5 Bone and Potash Mixture.....	7.00	....	5.00
Royser's Arrow 7 Per Cent Potato Guano.....	6.00	5.76	5.00
Royser's Holdfast 7 Per Cent Potato Guano.....	6.00	5.76	1.00
Royser's 7 Per Cent Ammoniated Phosphate.....	6.00	5.76	....
Royser's Irish Potato Guano	6.00	4.12	7.00
Royser's Velox Potato Grower	6.00	4.12	5.00
Royser's Canoe Brand Trucker	6.00	4.12	1.00
Royser's Tulip 5 Per Cent Ammoniated Phosphate.....	6.00	4.12	....
Royser's Pasquotank Potato Guano	6.00	3.30	8.00
Royser's Early Sweet Potato Grower.....	6.00	3.30	5.00
Oakley's Special Tobacco Guano	6.00	3.30	4.00
Royser's Heatherbloom High Grade Guano	6.00	3.30	4.00
Royser's Flagstaff Ammoniated Phosphate	6.00	3.30	....
Royser's Raven High Grade Guano.....	6.00	2.47	5.00
Royser's Dolphin 10 Per Cent Truck Guano.....	5.00	8.23	3.00
Royser's Greenleaf Trucker	5.00	8.23	2.50
Royser's Cabbage Guano	5.00	8.23	2.50
Royser's Maybrook Special Truck Compound	5.00	8.23	1.00
Royser's Velva 10 Per Cent Truck Compound.....	5.00	8.23	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Royster's Norva Truck Compond	5.00	5.76	5.00
Royster's Lotus Ammoniated Phosphate	5.00	5.76	....
Royster's Presto Top Dresser	4.00	8.23	4.00
Royster's Fourteno Top Dresser	4.00	8.23	....
Royster's Special Top Dresser	4.00	6.17	2.50
Ben's Favorite	4.00	3.30	4.00
Royster's Currituck Sweet Potato Guano.....	4.00	2.47	8.00
Royster's Threeino Top Dresser.....	3.00	7.40	....
Royster's Locomotive Top Dresser.....	2.00	8.23	5.00
Corbett & Moore's Top Dresser .....	....	9.87	3.00
Royster's Magic Top Dresser .....	....	7.40	3.00
Royster's Pure Raw Bone Meal, Total.....	21.50	3.70	....
Nitrate of Soda .....	....	15.21	....
Cotton Seed Meal .....	....	6.17	....
Royster's Tabor Special Fertilizer.....	4.00	8.23	....
Killibrew's Special	8.00	1.23	3.00
Royster's 7-6-3 Special	7.00	4.94	3.00
Royster's War Dog Top Dresser.....	4.00	6.17	1.00
Royster's Ground Fish Scrap.....	4.00	8.23	....
Royster's Palmo Trucker	5.00	8.23	2.00

RICHMOND GUANO COMPANY,
RICHMOND, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Rex Truck Special	7.00	4.11	1.00
Perfection Tobacco Special	8.00	3.29	1.00
Rex Tobacco Special	6.00	3.29	1.00
Gilt Edge Tobacco Special	8.00	2.47	1.00
Gilt Edge Cotton Special	8.00	2.47	1.00
Special Tobacco Fertilizer	9.00	2.26	2.00
Tip Top Tobacco Special.....	9.00	2.06	1.00
Tip Top Cotton Special.....	9.00	2.06	1.00
Premium Tobacco Special	9.00	1.65	1.00
Premium Cotton Special	9.00	1.65	1.00
Rex Corn Special	12.00	1.00	1.00
Bone Mixture	9.00	1.65	1.00
Bone Mixture	10.00	.82	1.00
Premium Corn Grower	10.00	.82	1.00
Premium Crop Grower	10.00	.82	1.00
Top Dresser	4.00	8.23	....
Ammoniated Phosphate 10-4-0	10.00	3.29	....
Ammoniated Phosphate 10-3-0	10.00	2.47	....
Ammoniated Phosphate 10-2½-0	10.00	2.06	....
Ammoniated Phosphate 12-2-0	12.00	1.65	....
Perfection Guano	8.00	3.29	....
Edwards' Cotton Grower	6.00	3.29	....
Rex Tobacco Guano	6.00	3.29	....
Gilt Edge Guano	9.00	2.47	....
Tip Top Guano	9.50	2.06	....
Premium Guano	10.00	1.65	....
Rex Corn Guano	12.00	1.00	....
Premium Grain Guano	11.00	.82	....
Rex Dissolved Bone Phosphate	16.00	....	....
High Grade Acid Phosphate	14.00	....	....
Premium Dissolved Bone	13.00	....	....
Old Homestead Dissolved Bone.....	12.00	....	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Premium Brand Fertilizer	8.00	1.65	2.00
Premium Tobacco Fertilizer	8.00	1.65	2.00
Nitrate of Soda .....	....	14.80	....
Sulphate of Ammonia .....	....	19.75	....
10 Per Cent Cabbage Guano.....	6.00	8.23	2.00
Gilt Edge Top Dresser.....	4.00	8.23	4.00
Special Top Dresser .....	....	7.40	3.00
Premium Top Dresser	4.00	6.17	2.50
Smith's 7 Per Cent Special.....	6.00	5.76	5.00
7 Per Cent Truck Fertilizer.....	6.00	5.76	5.00
Special High Grade for Truck.....	7.00	4.94	5.00
Clark's Special Formula	7.00	4.94	6.00
Southern Trucker	8.00	4.11	5.00
5 Per Cent Truck Fertilizer.....	6.00	4.11	5.00
Bone and Blood Special.....	8.00	3.29	6.00
Perfection Special	8.00	3.29	4.00
Edwards' Prolific Cotton Grower.....	6.00	3.29	4.00
Sanders' Special Formula for Bright Tobacco.....	9.00	2.88	5.00
Gilt Edge Fertilizer	8.00	2.47	3.00
Gilt Edge Tobacco Fertilizer.....	8.00	2.47	3.00
Carolina Special Tobacco Fertilizer	9.00	2.47	3.00
Carolina Bright Tobacco Special.....	8.00	2.47	3.00
Collins' Special Fertilizer	9.00	2.47	2.00
Beeson's Best Fertilizer	8.00	2.47	10.00
Carter's Special for Tobacco.....	4.00	2.47	6.00
Carolina Bright Special Tobacco Fertilizer.....	8.00	2.26	2.50
Carolina Cotton Grower	9.00	2.26	2.00
Burton's Special Tobacco Fertilizer.....	9.00	2.06	3.00
Tip Top Fertilizer	8.00	2.06	3.00
Tip Top Tobacco Fertilizer.....	8.00	2.06	3.00
Special Premium Brand for Tobacco.....	8.00	1.85	2.25
Special Premium Brand for Plants.....	8.00	1.85	2.25
Carolina Bright for Cotton.....	8.00	2.06	1.50
C. & B.'s Best Fertilizer.....	9.00	1.65	3.00
Bumper Crop Ammoniated Guano.....	9.00	1.65	3.00
Lowry's Special Fertilizer	9.00	1.65	3.00
Beeson's Favorite Fertilizer	8.00	1.65	10.00
Rex Ammoniated Crop Grower.....	8.00	1.65	3.00
Smith's Special Fertilizer	4.00	1.65	7.00
Rex Tobacco Fertilizer	8.00	1.65	4.00
Cracker Jack Fertilizer	9.00	1.65	2.00
Edgecombe Cotton Grower	8.00	1.65	2.00
Premium Cotton Fertilizer	8.00	1.65	2.00
Premium Corn Special	12.00	1.00	2.00
Premium Wheat Special	12.00	1.00	2.00
Premium Cotton Grower	9.00	.82	3.00
Premium Wheat Grower	9.00	.82	2.00
Premium Peanut Special	8.00	.82	4.00
Premium Grain Special	8.00	.82	4.00
Tip Top Grain Guano.....	9.00	.82	3.00
Premium Bone and Potash Mixture.....	13.00	....	3.00
High Grade Bone and Potash Mixture.....	12.00	....	5.00
Regal Bone and Potash Mixture.....	12.00	....	4.00
Johnson's Best Bone and Potash.....	10.00	....	5.00
Rex Bone and Potash Mixture.....	10.00	....	4.00
Bone and Potash Mixture	14.00	....	2.00
Tip Top Bone and Potash Mixture.....	8.00	....	4.00
Winter Grain and Grass Grower.....	8.00	....	4.00
Premium Peanut Grower	8.00	....	4.00
Bone and Potash Mixture.....	10.00	....	2.00
Bone and Potash Mixture.....	12.00	....	2.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Bone and Potash Mixture.....	11.00	....	1.00
Pure Raw Bone Meal, Total.....	22.50	3.70	....
Pure Animal Bone	25.00	2.47	....
High Grade Truck Special	7.00	4.94	1.00
Special Tobacco Fertilizer	8.00	2.47	2.00

RASIN MONUMENTAL COMPANY,
BALTIMORE, Md.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Rasin's Searchlight High Grade Guano.....	10.00	3.29	2.00
Rasin's Dixie Tobacco Guano	9.00	2.26	2.00
Rasin's Dixie Plant and Truck Guano.....	8.00	4.12	2.00
Rasin's Empire High Grade Manure.....	8.00	3.29	2.00
Rasin's Gold Standard, Revised	8.00	2.47	2.00
Rasin's Empire Guano Special, Revised.....	8.00	2.47	2.00
Rasin's Indian Brand for Tobacco, Revised.....	8.00	2.47	2.00
Rasin's Empire Guano	8.00	1.65	2.00
Rasin's Empire Guano for Tobacco.....	8.00	1.65	2.00
Rasin's Dixie Fertilizer	8.00	1.65	2.00
Rasin's Baltimore Special Guano	10.00	3.29	1.00
Rasin's Empire Complete Compound	10.00	2.47	1.00
Rasin's Seawall Complete Guano	9.00	1.65	1.00
Rasin's Dixie Guano, Revised	9.00	2.47	1.00
Rasin's Royal Complete Manure	8.00	4.12	1.00
Rasin's Victoria Complete Guano	8.00	3.29	1.00
Rasin's Gold Standard, Revised, No. 2.....	8.00	2.47	1.00
Rasin's Indian Brand for Tobacco, Revised, No. 2.....	8.00	2.47	1.00
Rasin's Empire Special Ammoniated Superphosphate.....	12.00	1.65	....
Rasin's Dixie Ammoniated Superphosphate	10.00	3.29	....
Rasin's Empire Ammoniated Superphosphate	10.00	2.47	....
Rasin's Special Crop Preparation	10.00	1.65	....
Rasin's Baltimore Ammoniated Superphosphate	9.00	2.47	....
Rasin's Seawall Ammoniated Superphosphate	8.00	4.12	....
Rasin's Capital Ammoniated Superphosphate	8.00	3.29	....
Rasin's Ammoniated Superphosphate	6.00	4.12	....
Rasin's General Ammoniated Superphosphate	6.00	3.29	....
Rasin's 16 Per Cent Acid Phosphate.....	16.00	....	....
Rasin's Acid Phosphate	14.00	....	....
Rasin's Seawall Special Guano, Revised	10.00	.82	1.00
Rasin's Nine Three Three Guano.....	9.00	2.47	3.00
Rasin's Empire Guano Special	8.00	2.47	3.00
Rasin's Gold Standard	8.00	2.47	3.00
Rasin's Indian Brand for Tobacco.....	8.00	2.47	3.00
Nitrate of Soda .....	....	14.82	....

REIDSVILLE FERTILIZER COMPANY, Inc.,
REIDSVILLE, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Burton Special	10.00	1.65	2.00
Lion Brand	9.00	2.47	6.00
Big Crop	9.00	1.65	1.00
Hustler	9.00	.82	2.00
Royal Fertilizer	8.00	2.47	3.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Farmer's Tobacco Fertilizer	8.00	2.47	3.00
Climax	8.00	2.05	3.00
Champion Guano	8.00	1.65	2.00
Banner Fertilizer	8.00	1.65	2.00
Plant Bed Special	9.00	2.47	....
Ammoniated Phosphate	10.00	1.65	....
Reidsville Acid	16.00	....	....

THE ROBERTSON FERTILIZER COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Robertson's 3-8-2 Guano	8.00	2.46	2.00
Robertson's 3-8-1 Guano	8.00	2.46	1.00
Double Dollar Tobacco	8.00	1.64	2.00
Robertson's 3-10 Guano	10.00	2.46	....
Robertson's 3-9 Guano	9.00	2.46	....
Robertson's 3-12 Guano	12.00	2.46	....
Robertson's 2-12 Guano	12.00	1.64	....
Robertson's 2-10 Guano	10.00	1.64	....
Robertson's 4-10 Guano	10.00	3.29	....
High Peak Acid Phosphate.....	16.00	....	....
Scepter Acid Phosphate	14.00	....	....
Nitrate of Soda .....	....	14.80	....
Fish Guano .....	....	8.22	....
Double Dollar Soluble	8.00	1.64	2.00

ROCK HILL FERTILIZER COMPANY,
ROCK HILL, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Piedmont	9.00	2.47	....
Piedmont	10.00	2.47	....
Piedmont	12.00	2.47	....
Piedmont	10.00	1.65	....
Piedmont	10.00	3.29	....
Piedmont	8.00	3.29	....
Piedmont	8.00	2.47	3.00
Piedmont	9.00	1.65	2.00
Piedmont	8.00	2.47	1.00
Piedmont	9.00	1.65	1.00
Piedmont	16.00	....	....
Nitrate of Soda .....	....	14.85	....

ROBESON MANUFACTURING COMPANY,
LUMBERTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Silver Dollar	8.00	2.47	3.00
Tobacco Special	8.00	2.47	2.00
"RMC" 8-4	8.00	3.30	....
"RMC" 9-3	9.00	2.47	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
"RMC" 6-4	6.00	3.30	....
"RMC" 8-4 Blood	8.00	3.30	....
16 Per Cent Acid Phosphate.....	16.00	....	....
Nitrate of Soda .....	....	14.81	....
Sulphate of Ammonia .....	....	20.75	....
"RMC" Top Dresser	3.00	7.41	....
"RMC" 8-3-1	8.00	2.47	1.00
"RMC" 10-4 Blood	10.00	3.30	....
Cremo	8.00	1.65	2.00

READ PHOSPHATE COMPANY,
CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Read's Cotton Guano	10.00	.82	1.00
Read's Carolina Special	10.00	1.65	1.00
Read's Cotton Flower	9.00	2.46	1.00
Read's Soil Food	8.00	2.46	1.00
Read's Soluble Fish Guano	9.00	1.65	1.00
Read's Boll Weevil Exterminator.....	8.00	3.28	1.00
Read's Blood and Bone Mixture	8.00	3.28	....
Read's High Grade Dissolved Bone	16.00	....	....
Nitrate of Soda .....	....	14.75	....

ROBERSONVILLE GUANO COMPANY,
ROBERSONVILLE, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Roberson's High Grade Acid Phosphate	16.00	....	....
Little's High Grade Meal and Fish Guano.....	9.00	2.47	....
Little's Special Tobacco Grower	8.00	2.47	2.00
Roberson's Special Tobacco Grower.....	9.00	2.47	....
Roberson's Fish Scrap .....	....	8.20	....
Roberson's Nitrate of Soda.....	....	15.60	....

SOUTHERN COTTON OIL COMPANY,
CONCORD, DAVIDSON, GIBSON, MONROE, SHELBY, WADESBORO.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
SCO Co. Ammoniated	10.00	3.29	2.00
SCO Co. Ammoniated	10.00	2.47	2.00
SCO Co. Ammoniated	10.00	1.65	2.00
SCO Co. Ammoniated	10.00	2.47	1.00
SCO Co. Ammoniated	10.00	1.65	1.00
SCO Co. Ammoniated	9.00	2.47	2.00
SCO Co. Ammoniated	9.17	1.65	2.00
SCO Co. Ammoniated	9.00	1.65	1.00
SCO Co. Ammoniated	9.00	2.47	1.00
SCO Co. Ammoniated	8.00	2.47	2.00
SCO Co. Ammoniated	8.00	2.06	2.00
SCO Co. Ammoniated	8.00	1.65	2.00

<i>Name of Brand</i>		<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
SCO Co. Ammoniated		8.00	3.29	1.00
SCO Co. Ammoniated		8.00	2.47	1.00
SCO Co. Ammoniated Top Dresser		4.00	6.17	2.00
SCO Co. Ammoniated Top Dresser		4.00	6.17	1.00
SCO Co. Ammoniated Top Dresser		4.00	9.88	....
SCO Co. Ammoniated Top Dresser		4.00	5.76	....
SCO Co. Ammoniated Top Dresser		4.00	6.17	....
SCO Co. Ammoniated Top Dresser		3.00	7.40	....
SCO Co. Ammoniated Top Dresser		4.00	8.22	....
SCO Co. Ammoniated Top Dresser .....		....	8.22	2.00
SCO Co. Ammoniated Top Dresser		4.00	8.22	2.00
SCO Co. Ammoniated Top Dresser		5.00	5.76	2.00
SCO Co. Ammoniated Top Dresser		4.00	9.05	2.50
SCO Co. Ammoniated Compound.....		12.00	2.47	....
SCO Co. Ammoniated Compound.....		12.00	1.56	....
SCO Co. Ammoniated Compound.....		11.00	2.47	....
SCO Co. Ammoniated Compound.....		11.00	1.65	....
SCO Co. Ammoniated Compound.....		10.00	3.29	....
SCO Co. Ammoniated Compound.....		10.00	2.47	....
SCO Co. Ammoniated Compound.....		12.00	1.65	....
SCO Co. Ammoniated Compound.....		9.00	3.29	....
SCO Co. Ammoniated Compound.....		9.00	2.47	....
SCO Co. Acid Phosphate		16.00	....	....
SCO Co. Acid Phosphate		14.00	....	....
SCO Co. Acid Phosphate		13.00	....	....
SCO Co. Ammoniated Compound.....		6.00	3.29	....
SCO Co. Ammoniated		8.00	3.29	2.00
Nitrate of Soda .....		....	14.80	....
SCO Co. Ammoniated		10.00	3.29	1.00
SCO Co. Ammoniated Compound		8.00	3.29	....
SCO Co. Ammoniated Compound		10.00	1.65	....

SWIFT & CO., INC.,
BALTIMORE, MD.

<i>Name of Brand</i>		<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Special Top Dresser		5.00	8.22	....
Spinach Fertilizer		8.00	6.59	....
Mammoth Potato Grower		9.00	5.76	....
Top Dresser Formula No. 1.....		8.00	5.76	....
Favorite Trucker		7.00	5.76	....
Excelsior		6.00	5.76	5.00
High Grade Trucker		6.00	5.76	3.00
Trucking Compound Formula No. 2.....		6.00	5.76	2.00
Special High Grade Trucker		6.00	5.76	1.00
Trucking Compound		6.00	5.76	....
Special Truck Fertilizer		8.00	4.11	....
Special Early Truck		7.00	4.11	1.00
Virginia Potato Grower		7.00	4.11	....
Special Baltimore Formula		10.00	3.29	....
Special Truck Grower		8.00	2.47	3.00
Red Steer		8.00	1.65	2.00
Special Formula "A".....		8.00	3.29	....
Revised 1917 Red Steer.....		10.00	1.65	....
High Grade Acid Phosphate		16.00	....	....
Garden and Truck		8.00	3.29	1.00
Revised 1917 Virginia Tobacco Grower.....		8.00	2.47	1.00
Sweet Potato Fertilizer		9.00	2.47	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Special Formula "C"	12.00	1.65	....
Farmer's Favorite	9.00	1.65	1.00
Swift's Grain and Grass Grower.....	10.00	.82	1.00

A. A. SMITH,
ATLANTA, GA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Sulphate of Ammonia .....	....	20.00	....
Nitrate of Soda .....	....	14.80	....
Blood .....	....	13.15	....
Blood .....	....	13.97	....
Tankage	18.31	4.93	..
Tankage	13.73	5.34	....
Tankage	2.28	5.75	....
Tankage	2.28	8.22	....
Tankage	4.57	8.22	....
Tankage	4.57	9.04	....
Tankage	4.57	9.86	....
Ground Steamed Bone	22.00	2.46	....
Fish Scrap	4.57	8.22	....

SPARTANBURG FERTILIZER COMPANY,
SPARTANBURG, S. C.

<i>* Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Plant Food	10.00	1.65	....

TUSCARORA FERTILIZER COMPANY,
GREENSBORO, CHICAGO, AND WILMINGTON.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Ammoniated Superphosphate	12.00	3.30	....
Ammoniated Superphosphate	12.00	2.47	....
Ammoniated Superphosphate	12.00	.82	....
Ammoniated Superphosphate	11.00	3.30	....
Ammoniated Superphosphate	11.00	2.47	....
Fertilizer No. 1121	11.00	1.65	1.00
Ammoniated Superphosphate	11.00	1.65	....
Ammoniated Superphosphate	11.00	.82	....
Ammoniated Superphosphate	10.00	3.30	....
Grain Special	10.00	1.65	....
Fertilizer No. 1011 for Grain.....	10.00	.82	1.00
Special Grain Fertilizer	10.00	.62	2.00
Special Grain Fertilizer	10.00	.41	2.00
Special Grain Fertilizer	10.00	.20	2.00
Ammoniated Superphosphate	9.00	3.30	....
Fertilizer No. 931	9.00	2.47	1.00
Ammoniated Superphosphate	9.00	2.47	....
Fertilizer No. 92 ½ 1	9.00	2.05	1.00
Fertilizer No. 922 for Grain.....	9.00	1.65	2.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Fertilizer No. 921 for Grain.....	9.00	1.65	1.00
Fertilizer No. 841	8.00	3.30	1.00
Ammoniated Superphosphate	8.00	3.30	....
Alkaline Bone	10.00	....	5.00
Acid and Potash	10.00	....	4.00
Bone and Potash	10.00	....	3.00
Bone and Potash	10.00	....	2.00
Bone and Potash 9-3	9.00	....	3.00
Bone and Potash	8.00	....	5.00
Bone and Potash	8.00	....	4.00
Tuscarora Acid Phosphate	17.00	....	....
Tuscarora Acid Phosphate	16.00	....	....
Tuscarora Acid Phosphate	14.00	....	....
Tuscarora Acid Phosphate	13.00	....	....
Tuscarora Acid Phosphate	12.00	....	....
Kainit .....	....	....	12.00
Muriate of Potash .....	....	....	50.00
Sulphate of Potash .....	....	....	50.00
Nitrate of Soda .....	....	14.81	....
Dried Blood .....	....	13.16	....
Tankage .....	....	8.23	....
Bone Meal (Total).....	24.00	2.47	....
Raw Bone Meal (Total).....	22.00	3.70	....
Cotton Seed Meal .....	....	6.18	....
Sulphate of Ammonia .....	....	20.56	....
Fertilizer No. 824	8.00	1.65	4.00
Fertilizer No. 823	8.00	1.65	3.00
Tuscarora Standard	8.00	1.65	2.00
Tuscarora Standard Tobacco Grower.....	8.00	1.65	2.00
Fertilizer No. 815	8.00	.82	5.00
Fertilizer No. 814	8.00	.82	4.00
Fertilizer No. 813	8.00	.82	3.00
Fertilizer No. 755	7.00	4.11	5.00
5 Per Cent Trucker.....	6.00	4.11	7.00
Fertilizer No. 646	6.00	3.30	6.00
Manure Substitute	6.00	3.30	4.00
Fertilizer No. 637	6.00	2.47	7.00
Complete Top Dresser	4.00	6.18	2.50
Tuscarora Top Dresser .....	....	7.81	4.00
Tuscarora Chief Top Dresser.....	....	7.40	3.00
Bone and Potash	14.00	....	1.00
Phosphate and Potash	12.00	....	6.00
Bone and Potash	12.00	....	5.00
Bone and Potash	12.00	....	4.00
Bone and Potash	12.00	....	2.00
Sampson's Corn Mixture	11.00	....	5.00
Standard Cotton Grower	8.50	1.65	2.00
Tuscarora Trucker	8.00	4.11	7.00
Fertilizer No. 846	8.00	3.30	6.00
Fertilizer No. 845	8.00	3.30	5.00
Fertilizer No. 844	8.00	3.30	4.00
Tuscarora Tobacco Grower	8.00	3.30	4.00
Fertilizer No. 8310	8.00	2.47	10.00
Fertilizer No. 836	8.00	2.47	6.00
Fertilizer No. 835	8.00	2.47	5.00
Special for Tobacco	8.00	2.47	5.00
Boone's Special	8.00	2.47	4.00
Tobacco Special	8.00	2.47	3.00
Cotton Special	8.00	2.47	3.00
Tuscarora Blood and Bone.....	8.00	2.47	3.00
Fertilizer No. 833	8.00	2.47	3.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Tuscarora Tobacco Fertilizer	8.00	2.05	3.00
Good Enough	8.00	2.05	3.00
Tuscarora Champion	8.00	2.05	2.50
Tuscarora Champion Tobacco Grower.....	8.00	2.05	2.50
Snow's Tobacco Special	8.00	1.85	4.00
High Grade Trucker	8.00	1.65	10.00
Fertilizer No. 825	8.00	1.65	5.00
Fertilizer No. 1244	12.00	3.30	4.00
Ammoniated Superphosphate	12.00	1.65	....
Fertilizer No. 1044	10.00	3.30	4.00
Fertilizer No. 1033	10.00	2.47	3.00
Ammoniated Superphosphate	10.00	2.47	....
Fertilizer No. 1025	10.00	1.65	5.00
Fertilizer No. 1023	10.00	1.65	3.00
Fertilizer No. 1022	10.00	1.65	2.00
Ammoniated Superphosphate	10.00	1.65	....
Fertilizer No. 1021	10.00	1.65	1.00
Tuscarora Special Guano	10.00	.82	3.00
Phosphate and Potash	10.00	....	6.00
Fertilizer No. 933	9.00	2.47	3.00
Tobacco Fertilizer	9.00	2.47	3.00
Fertilizer No. 92 $\frac{3}{4}$ 2	9.00	2.26	2.00
Fertilizer No. 92 $\frac{1}{2}$ 5	9.00	2.05	5.00
Fertilizer No. 92 $\frac{1}{2}$ 3	9.00	2.05	3.00
Fertilizer No. 924	9.00	1.65	4.00
Tuscarora Chief	9.00	1.65	3.00
Fertilizer No. 921	9.00	1.65	1.00
Fertilizer No. 913	9.00	.82	3.00
Fertilizer No. 912	9.00	.82	2.00
Fertilizer No. 831 for Grain.....	8.00	2.47	1.00
Fertilizer No. 831	8.00	2.47	1.00
Standard for Grain	8.00	1.65	2.00
Fertilizer No. 832	8.00	2.47	2.00
Ammoniated Superphosphate	6.00	3.30	....

TENNESSEE CHEMICAL COMPANY.

GREENSBORO, CHICAGO, AND WILMINGTON.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Ox High Grade Guano	10.00	3.30	4.00
Ox High Grade Fertilizer	10.00	2.47	3.00
Ox Ammonia Compound	10.00	2.47	....
Ox Monroe Special	10.00	2.05	4.00
Ox High Grade Ammoniated Bone.....	10.00	2.05	2.00
Ox Extra High Grade Guano.....	10.00	2.05	3.00
Ox Southern Guano	10.00	1.65	4.00
Ox Fish Compound	10.00	1.65	2.00
Ox Slaughter House Bone	10.00	1.65	2.00
Ox Ammonia Compound	10.00	1.65	....
Ox Special Crop Grower	10.00	.82	3.00
Ox Fertilizer No. 1011	10.00	.82	1.00
Ox Cotton Guano	9.25	1.65	2.00
Ox Standard Fish Guano	9.25	1.65	2.00
Ox Standard Cotton Guano	9.25	1.65	2.00
Ox Cotton Grower	9.00	2.47	3.00
Ox Tobacco Grower	9.00	2.47	3.00
Ox Fertilizer No. 92 $\frac{1}{4}$ 4	9.00	1.85	4.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Ox Blood Bone and Potash.....	9.00	1.65	3.00
Ox Fertilizer No. 913	9.00	.82	3.00
Ox Fertilizer No. 912	9.00	.82	2.00
Ox Stand-by	8.50	1.65	2.00
Ox Fertilizer No. 844	8.00	3.30	4.00
Ox Fertilizer No. 835	8.00	2.47	5.00
Ox Special Compound Guano	8.00	2.47	3.00
Ox Surry County Tobacco Grower.....	8.00	2.47	3.00
Ox Surry County Tobacco Special.....	8.00	2.05	3.00
Ox Blood and Bone	8.00	2.05	2.50
Ox Surry County Tobacco Winner.....	8.00	1.85	4.00
Ox Fertilizer No. 824	8.00	1.65	4.00
Ox Fertilizer No. 823	8.00	1.65	3.00
Ox Fertilizer No. 822	8.00	1.65	2.00
Ox Surry County Bright Tobacco Grower.....	8.00	1.65	2.00
Ox Fertilizer No. 813	8.00	.82	3.00
Ox Fertilizer No. 755	7.00	4.11	5.00
Ox Top Dresser	7.00	3.30	3.00
Ox Top Dresser	5.00	8.23	2.00
Ox Top Dresser	5.00	8.23	2.00
Ox Top Dresser	4.00	6.18	2.50
Ox Electric Top Dresser	2.00	8.23	3.00
Ox Top Dresser .....	....	7.81	4.00
Ox Top Dresser .....	....	7.40	3.00
Ox 13 and 4	13.00	....	4.00
Ox Alkaline Bone	12.00	....	2.00
Ox Bone and Potash	11.00	....	1.00
Ox Bone and Potash	10.00	....	5.00
Ox Potash Formula	10.00	....	4.00
Ox Phosphate and Potash	10.00	....	3.00
Ox Potash Mixture	10.00	....	2.00
Ox Potash Compound	8.00	....	4.00
Ox Extra High Grade Acid Phosphate.....	17.00	....	....
Ox Tennessee High Grade Acid Phosphate.....	16.00	....	....
Ox High Grade Dissolved Bone	14.00	....	....
Ox Special Acid Phosphate	13.00	....	....
Ox Acid Phosphate	12.00	....	....
Raw Bone Meal (Total).....	22.00	....	....
Cotton Seed Meal .....	....	6.18	....
Tankage .....	....	8.23	....
Kainit .....	....	....	12.00
Sulphate of Potash .....	....	....	50.00
Muriate of Potash .....	....	....	50.00
Dried Blood .....	....	13.16	....
Nitrate of Soda .....	....	14.81	....
Ox Ammoniated Superphosphate	12.00	3.30	....
Ox Ammoniated Superphosphate	12.00	2.47	....
Ox Ammoniated Superphosphate	12.00	.82	....
Ox Ammoniated Superphosphate	11.00	3.30	....
Ox Ammoniated Superphosphate	11.00	2.47	....
Ox Fertilizer No. 1121	11.00	1.65	1.00
Ox Ammoniated Superphosphate	11.00	1.65	....
Ox Ammoniated Superphosphate	11.00	.82	....
Ox Ammoniated Superphosphate	10.00	3.30	....
Ox Ammoniated Superphosphate	10.00	2.47	....
Ox Fertilizer No. 1021	10.00	1.65	1.00
Ox Ammoniated Superphosphate	10.00	1.65	....
Ox Special Grain Fertilizer	10.00	.62	2.00
Ox Special Grain Fertilizer	10.00	.41	2.00
Ox Special Grain Fertilizer	10.00	.20	2.00
Ox Grain Special	10.00	1.65	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Ox Fertilizer No. 1011 for Grain.....	10.00	.82	1.00
Ox Ammoniated Superphosphate	9.00	3.30	....
Ox Fertilizer No. 931	9.00	2.47	1.00
Ox Ammoniated Superphosphate	9.00	2.47	....
Ox Fertilizer No. 92½1	9.00	2.05	1.00
Ox Fertilizer No. 921 for Grain.....	9.00	1.65	1.00
Ox Fertilizer No. 921	9.00	1.65	1.00
Ox Fertilizer No. 841	8.00	3.30	1.00
Ox Ammoniated Superphosphate	8.00	3.39	....
Ox Fertilizer No. 831 for Grain.....	8.00	2.47	1.00
Ox Fertilizer No. 831	8.00	2.47	1.00
Ox Fertilizer No. 822 for Grain.....	8.00	1.65	2.00
Ox Dissolved Bone Phosphate	16.00	....	....
Ox Fertilizer No. 92¾2	9.00	2.27	2.00
Ox Fertilizer No. 832	8.00	2.47	2.00
Ox Ammoniated Superphosphate	6.00	3.30	....
Ox Ammoniated Superphosphate	12.00	1.65	....

TENNESSEE COAL, IRON AND RAILROAD COMPANY,
BIRMINGHAM, ALA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Duplex Basic Phosphate	18.00	....	....

UNION GUANO COMPANY,
WINSTON-SALEM, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Union Tobacco Special	8.00	2.47	3.00
Union Tobacco Special, Revised.....	8.00	2.47	2.00

L. J. UPTON & CO., INC.,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Upton's Truck Guano	8.00	5.76	....
Upton's Special Fertilizer (Revised 1917).....	8.00	4.11	....

UNION SEED AND FERTILIZER COMPANY,
RALEIGH, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Raleigh Standard Guano	8.00	2.26	2.00
U. S. & F. Brand No. 3.....	9.00	2.26	.50
U. S. & F. Brand No. 4.....	9.00	2.47	....
U. S. & F. Brand No. 5.....	9.00	3.29	.50
U. S. & F. Brand No. 15	8.00	3.29	1.00

UNION SEED AND FERTILIZER COMPANY,
CHARLOTTE, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
U. S. & F. Co. Brand No. 1-C.....	12.00	1.65	....
U. S. & F. Co. Brand No. 2-C.....	10.00	1.65	....
U. S. & F. Co. Brand No. 3-C.....	9.00	2.26	.50
U. S. & F. Co. Brand No. 4-C.....	9.00	2.47	.50
U. S. & F. Co. Brand No. 5-C.....	10.00	3.29	.50
U. S. & F. Co. Brand No. 6-C.....	8.00	2.47	.50
U. S. & F. Co. Charlotte Special.....	8.00	2.47	1.00
U. S. & F. Co. Brand No. 13-C.....	8.00	2.47	3.00

UNION SEED AND FERTILIZER COMPANY,
WILMINGTON, N. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Brand No. 3	9.00	2.24	.50
Brand No. 4	9.00	2.47	.50
Brand No. 5	9.00	3.29	.50
Brand No. 6	8.00	2.47	.50
Brand No. 7	8.00	2.88	.50
Brand No. 8	8.00	3.29	.50
Brand No. 15	8.00	3.29	1.00
Brand No. 1	12.00	1.65	....
Brand No. 10	9.00	2.47	....
Brand No. 11	10.00	2.47	....
Brand No. 12	10.00	3.29	....
Brand No. 13	8.00	3.29	....
Brand No. 14	6.00	3.29	....
High Grade Acid Phosphate.....	16.00	....	....
Nitrate of Soda .....	....	14.76	....
Wilmington Top Dresser	3.00	7.39	....

R. L. UPSHUR GUANO COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Upshur's F. F. (Farmer's Favorite).....	7.00	4.11	6.00
Upshur's 5 per cent Guano	7.00	4.11	5.00
Upshur's 8-3-3 Guano	8.00	2.47	3.00
Upshur's O. P. (Old Plantation).....	8.00	2.06	3.00
Upshur's Premo Cotton Guano	8.00	1.65	2.00
Upshur's 10 Per Cent Top Dresser.....	5.00	8.23	....
Upshur's Spinach Top Dresser	9.00	5.76	....
Upshur's Special 7 Per Cent.....	6.00	5.76	1.00
Upshur's 8-5-1 Special	8.00	4.11	1.00
Upshur's 12-2 Ammoniated Phosphate	12.00	1.65	....
Upshur's 9-3 Ammoniated Phosphate	9.00	2.47	....
Upshur's 10-4 Ammoniated Phosphate	10.00	3.29	....
Upshur's 6-7 Ammoniated Phosphate	6.00	5.76	....
Upshur's 9-3-1 Guano	9.00	2.47	1.00
Upshur's 8-3-2 Guano	8.00	2.47	2.00
Upshur's 8-5-3 Guano	8.00	4.11	3.00
Upshur's 6-4 Ammoniated Phosphate	6.00	3.29	....
Upshur's 16 Per Cent Acid Phosphate.....	16.00	....	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Upshur's 14 Per Cent Acid Phosphate.....	14.00	....	....
Upshur's G., G. & C. (Grain, Grass and Cotton).....	8.00	1.65	2.00
Upshur's 8-5 Ammoniated Phosphate	8.00	4.11	....

VIRGINIA-CAROLINA CHEMICAL COMPANY,
RICHMOND, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
ALLISON & ADDISON'S			
Fulton Acid Phosphate	14.00	....	....
I.X.L. Acid Phosphate	13.00	....	....
Standard Acid Phosphate	12.00	....	....
Rockett's Acid Phosphate	12.00	....	....
B. P. Potash Mixture	10.00	....	2.00
McGavock's Special Potash Mixture.....	10.00	....	2.00
Star Brand Special Tobacco Manure.....	9.00	2.26	2.00
Star Brand Special Tobacco Manure.....	9.00	2.26	2.00
Star Brand Special High Grade.....	9.00	2.06	5.00
Star Brand Guano	9.00	1.65	1.00
Little Giant Grain and Grass Grower.....	9.00	.82	2.00
Anchor Brand Tobacco Fertilizer	8.50	2.26	2.00
Star Brand Vegetable Guano.....	8.00	3.71	4.00
A. A. Guano	8.00	2.47	3.00
Anchor Brand Fertilizer	8.00	1.65	2.00
Old Hickory Guano	8.00	1.65	2.00
Peanut Grower	8.00	1.00	4.00

ATLANTIC AND VIRGINIA FERTILIZER COMPANY'S

Eureka Acid Phosphate	16.00	....	....
Valley of Virginia Phosphate.....	14.00	....	....
Crenshaw's Acid Phosphate	13.00	....	....
Our Acid Phosphate	12.00	....	....
Eureka Bone and Potash Compound.....	10.00	....	2.00
Eureka Ammoniated Bone Special for Tobacco.....	9.00	2.06	2.00
Orient Complete Manure	9.00	1.65	2.00
Virginia Truckers	8.00	4.11	5.00
Eureka Ammoniated Bone	8.00	1.65	2.00
Orient Special for Tobacco.....	8.00	1.65	2.00
Carolina Truckers	7.00	5.76	7.00
Peanut Grower	8.00	1.00	4.00

CHARLOTTE OIL AND FERTILIZER COMPANY'S

Catawba Acid Phosphate	14.00	....	....
15 Per Cent Acid Phosphate.....	15.00	....	....
Acid Phosphate	13.00	....	....
Dayvault's Special	12.00	....	....
Dissolved Bone	12.00	....	....
Oliver's Perfect Wheat Grower.....	11.00	2.47	4.00
Ten Two Bone and Potash.....	10.00	....	2.00
High Grade Special Tobacco Fertilizer.....	9.00	2.06	2.00
Queen of the Harvest C. S. M.	9.00	1.65	2.00
McCrory's Diamond Bone and Potash.....	9.00	....	3.00
Groom's Special Tobacco Fertilizer.....	8.00	2.47	4.00
Catawba Guano B. G.	8.00	2.47	3.00
Special 3 Per Cent Guano C. S. M.	8.00	2.47	2.00
Ammoniated Guano B. G.	8.00	2.06	1.50
Ammoniated Guano C. S. M.	8.00	2.06	1.50
The Leader B. G.	8.00	1.65	2.00
King Cotton Grower	8.00	1.65	2.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
DAVIE & WHITTLE'S			
Owl Brand High Grade Acid Phosphate.....	16.00	....	....
Owl Brand High Grade Dissolved Bone	14.00	....	....
Owl Brand Acid Phosphate	13.00	....	....
Owl Brand Dissolved Bone	12.00	....	....
Owl Brand Acid Phosphate with Potash.....	10.00	....	2.00
Owl Brand High Grade 3 Per Cent Soluble Guano.....	9.00	2.06	3.00
Owl Brand Special Tobacco Guano	9.00	2.06	2.00
Owl Brand Truck Guano	8.00	4.94	5.00
Owl Brand Guano for Tobacco	8.00	2.47	3.00
Vinco Guano	8.00	1.65	3.00
Owl Brand Guano	8.00	1.65	2.00
Peanut Grower	8.00	1.00	4.00

DURHAM FERTILIZER COMPANY'S

Best Acid Phosphate	16.00	....	....
Standard High Grade Acid Phosphate	14.00	....	....
Excelsior Dissolved Bone	14.00	....	....
Blackburg Dissolved Bone	13.00	....	....
North Carolina Farmers' Alliance.....	13.00	....	....
Double Bone Phosphate	13.00	....	....
Acid Phosphate	12.00	....	....
Great Wheat and Corn Grower.....	10.50	....	1.50
Diamond Wheat Mixture	10.00	....	3.00
Standard Wheat and Corn Grower	10.00	....	2.00
Blue Ridge Wheat Grower.....	10.00	....	2.00
Standard Wheat Grower	10.00	....	2.00
Bone and Potash Mixture.....	10.00	....	2.00
L. and M. Special	9.00	2.47	2.00
Standard Guano	9.00	1.65	2.00
Ammoniated Fertilizer	9.00	1.65	1.00
Special Plant and Truck Fertilizer.....	8.00	4.11	3.00
Durham High Grade	8.00	3.29	4.00
Gold Medal Brand	8.00	2.47	3.00
Yellow Leaf Tobacco Guano.....	8.00	2.47	3.00
North Carolina Farmers' Alliance Official.....	8.00	2.06	3.00
Pride of Durham Tobacco Grower.....	8.00	2.06	3.00
Raw Bone Superphosphate for Tobacco.....	8.00	2.06	2.00
Raw Bone Superphosphate	8.00	2.06	1.50
Genuine Bone and Peruvian Guano.....	8.00	1.65	2.00
Genuine Bone and Peruvian Guano for Tobacco.....	8.00	1.65	2.00
Blackburg Soluble Guano	8.00	1.65	2.00
Progressive Farmer Guano	8.00	1.65	2.00
Carr's Special Wheat Grower.....	8.00	....	4.00
Best Potato Manure	7.00	5.76	7.00
Peanut Grower	8.00	1.00	4.00

LYNCHBURG GUANO COMPANY'S

Ironside Acid Phosphate	16.00	....	....
High Grade Acid Phosphate.....	14.00	....	....
Arvonja Acid Phosphate	13.00	....	....
Spartan Acid Phosphate	12.00	....	....
Alpine Mixture	10.00	....	5.00
S. W. Special Bone and Potash Mixture.....	10.00	....	4.00
Dissolved Bone and Potash	10.00	....	2.00
Independent Standard	8.50	1.65	2.00
Bright Belt Guano	8.00	2.47	3.00
Solid Gold Tobacco Guano	8.00	2.26	4.00
New Era	8.00	1.65	3.00
Lynchburg Soluble	8.00	1.65	2.00
Lynchburg Soluble for Tobacco.....	8.00	1.65	2.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
NORFOLK AND CAROLINA CHEMICAL COMPANY'S			
Norfolk Reliable Acid Phosphate.....	14.00	....	....
Norfolk Best Acid Phosphate.....	13.00	....	....
Norfolk Soluble Bone	12.00	....	....
Norfolk Bone and Potash.....	10.00	....	2.00
Norfolk Truck and Tomato Grower.....	8.00	4.12	5.00
Amazon High Grade Manure.....	8.00	2.47	3.00
Amazon Special High Grade Tobacco Guano.....	8.00	2.47	3.00
Cooper's Bright Tobacco Fertilizer.....	8.00	2.06	3.00
Genuine Slaughterhouse Bone Guano.....	8.00	2.06	2.00
Peanut Grower	8.00	1.00	4.00
Crescent Brand Ammoniated Fertilizer.....	8.00	1.65	2.00
Genuine Slaughterhouse Bone Guano	8.00	1.65	2.00
Bright Leaf Tobacco Grower.....	8.00	2.47	3.00
OLD DOMINION GUANO COMPANY'S			
High Grade Acid Phosphate.....	14.00	....	....
Bone Phosphate	13.00	....	....
Royster's Acid Phosphate	12.00	....	....
Obelisk Brand Bone and Potash.....	10.00	....	4.00
Planter's Bone and Potash Mixture	10.00	....	3.00
Alkaline Bone and Potash.....	10.00	....	2.00
Horne's Cotton Fertilizer	9.00	2.06	3.00
Standard Raw Bone Soluble Guano.....	9.00	1.65	1.00
Farmer's Friend High Grade Fertilizer.....	8.00	2.47	3.00
Farmer's Friend Special Tobacco Fertilizer.....	8.00	2.47	3.00
Osceola Tobacco Guano	8.00	2.06	3.00
Farmer's Friend Fertilizer	8.00	1.65	2.00
Special Wheat Guano	8.00	1.65	2.00
Soluble Tobacco Guano	8.00	1.65	2.00
Bullock's Cotton Guano	8.00	1.65	2.00
Miller's Special Wheat Mixture.....	8.00	....	4.00
7-7-7 Truck Guano	7.00	5.76	7.00
Potato Manure	7.00	4.11	8.00
7 Per Cent Truck Fertilizer.....	6.00	5.76	6.00
6-7-5 Truck Guano	6.00	5.76	5.00
Special Sweet Potato Guano.....	6.00	1.65	6.00
10 Per Cent Truck Fertilizer.....	5.00	8.23	2.50
Soluble Guano	8.00	1.65	2.00
Farmer's Soluble Bone High Grade Special Tobacco Manure	8.00	2.47	3.00
Peanut Grower	8.00	1.00	4.00
POWERS-GIBBS & Co.'s			
Almont High Grade Acid Phosphate.....	14.00	....	....
Fulp's Acid Phosphate	13.00	....	....
Cotton Brand Acid Phosphate.....	13.00	....	....
Almont Acid Phosphate	12.00	....	....
Cotton Brand Acid Phosphate.....	12.00	....	....
Almont Acid Phosphate and Potash.....	10.50	....	1.50
Almont Wheat Mixture	10.00	....	3.00
Dissolved Bone and Potash.....	10.00	....	2.00
Cotton Seed Meal Standard Guano.....	9.00	2.47	2.00
Truck Farmer's Special Ammoniated Guano.....	8.00	3.29	5.00
Cotton Brand Ammoniated Dissolved Bone.....	8.00	3.29	4.00
Old Kentucky High Grade Tobacco Manure.....	8.00	2.47	3.00
Cotton Belt Ammoniated Guano	8.00	2.47	2.00
Carolina Golden Belt Ammoniated Guano for Tobacco.....	8.00	2.06	3.00
Powers' Ammoniated Guano	8.00	2.06	2.00
Gibbs' Ammoniated Guano	8.00	2.06	1.50
Almont Soluble Ammoniated Guano.....	8.00	1.65	2.00
Cotton Seed Meal Soluble Ammoniated Guano.....	8.00	1.65	2.00
Eagle Island Ammoniated Guano.....	8.00	1.65	2.00
Peanut Grower	8.00	1.00	4.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
SOUTHERN CHEMICAL COMPANY'S			
Comet Acid Phosphate	16.00	....	....
Click's 16 Per Cent Acid Phosphate.....	16.00	....	....
Red Cross 14 Per Cent Acid Phosphate.....	14.00	....	....
Victor Acid Phosphate	13.00	....	....
Chatham Acid Phosphate	13.00	....	....
Reaper Grain Application	12.00	....	3.00
Tar Heel Acid Phosphate.....	12.00	....	....
Horse Shoe Acid Phosphate.....	12.00	....	....
Quick Step Bone and Potash.....	11.00	....	5.00
Solid South	10.00	....	6.00
Winner Grain Mixture	10.00	....	4.00
Farmer's Pride Bone and Potash.....	10.00	....	3.00
Winston Bone and Potash	10.00	....	2.00
Mammoth Corn Grower	10.00	....	2.00
Mammoth Wheat and Grass Grower.....	10.00	....	2.00
Sun Brand Guano	9.00	2.06	5.00
George Washington Plant Bed for Tobacco.....	8.00	2.47	2.50
George Washington Plant Bed for Tobacco.....	8.00	2.47	2.50
Pilot Ammoniated Guano Special for Tobacco.....	8.00	2.06	3.00
Electric Tobacco Guano	8.00	1.65	2.00
Electric Standard Guano	8.00	1.65	2.00
Yadkin Complete Fertilizer	8.00	1.65	2.00
Click's Special Wheat Compound.....	8.00	....	4.00
J. G. TINSLEY COMPANY'S			
Powhatan Acid Phosphate	14.00	....	....
Dissolved S. C. Bone	13.00	....	....
Stonewall Brand Acid Phosphate.....	12.00	....	....
Bone and Potash Mixture.....	10.00	....	2.00
Tobacco Fertilizer	8.00	3.29	2.50
Richmond Brand Guano	8.00	2.47	3.00
Peanut Grower	8.00	1.00	4.00
Killinkinnick Tobacco Mixture	8.00	2.06	3.00
Lee Brand Guano	8.00	1.65	2.00
Stonewall Guano	8.00	1.65	2.00
Stonewall Tobacco Guano	8.00	1.65	2.00
Special Irish Potato Guano.....	6.00	5.76	6.00
7 Per Cent Ammoniated Guano for Truck.....	6.00	5.76	6.00
Irish Potato Guano	6.00	4.94	6.00
Strawberry Grower	6.00	3.29	4.00
Top Dresser	5.00	9.05	....
10 Per Cent Truck Guano.....	5.00	8.23	2.50
Appomattox Standard Tobacco Grower.....	8.00	1.65	2.00
Powhatan Tobacco Fertilizer	9.00	2.47	3.00
Peruvian High Grade Tobacco Guano.....	8.00	2.47	3.00
S. W. TRAVERS & Co's			
Champion Acid Phosphate	16.00	....	....
Dissolved Bone Phosphate	14.00	....	....
Standard Dissolved S. C. Bone.....	13.00	....	....
Capital Dissolved Bone	12.00	....	....
Capital Bone and Potash Compound.....	10.00	....	2.00
Capital Truck Fertilizer	8.00	3.29	3.00
Capital Tobacco Fertilizer	8.00	3.29	3.00
Big Leaf Tobacco Grower.....	8.00	2.47	3.00
Capital Cotton Fertilizer	8.00	2.06	2.00
National Fertilizer	8.00	1.65	2.00
National Special Tobacco Fertilizer.....	8.00	1.65	2.00
Beef Blood and Bone Fertilizer.....	8.00	1.65	2.00
Peanut Grower	8.00	1.00	4.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Special Wheat Compound	8.00	....	4.00
7 Per Cent Truck Fertilizer.....	6.00	5.76	5.00
National Tobacco Fertilizer	8.50	1.85	2.25

VIRGINIA STATE FERTILIZER COMPANY'S

Bull Run Acid Phosphate.....	16.00	....	....
Gilt Edge Brand Acid Phosphate.....	14.00	....	....
Clipper Brand Acid Phosphate.....	13.00	....	....
Lurich Acid Phosphate	12.00	....	....
Alps Brand Acid Phosphate.....	12.00	....	....
Mountain Top Bone and Potash.....	10.00	....	5.00
XX Potash Mixture	10.00	....	4.00
Dissolved Bone and Potash.....	10.00	....	2.00
No. 1 Soluble Guano	9.00	1.65	2.00
Highland King	9.00	1.65	1.00
Game Cock Special Tobacco.....	8.50	1.65	2.00
High Grade Tobacco Guano.....	8.00	2.47	3.00
Bull Dog Soluble Guano.....	8.00	2.47	3.00
Dunnington's Special Formula for Tobacco.....	8.00	2.47	3.00
Peerless Special Tobacco Guano.....	8.00	2.47	3.00
Buffalo Guano	8.00	2.06	3.00
Austrian Tobacco Grower	8.00	2.06	2.00
Gilt Edge Special Tobacco Guano	8.00	2.06	2.00
Virginia State Guano	8.00	1.65	2.00
Battle Axe Tobacco Guano.....	8.00	1.65	2.00
Gilt Edge Brand Dissolved Bone and Potash.....	8.00	....	4.00

VIRGINIA-CAROLINA CHEMICAL COMPANY'S

17 Per Cent Acid Phosphate	17.00	....	....
16 Per Cent Acid Phosphate.....	16.00	....	....
14 Per Cent Acid Phosphate.....	14.00	....	....
Special High Grade Potash Mixture.....	12.00	....	6.00
12-4 Grain Grower	12.00	....	4.00
High Grade Potash Mixture.....	12.00	....	5.00
Special Crop Grower	12.00	....	3.00
Grain Special	10.00	....	6.00
Standard Bone and Potash.....	10.00	....	5.00
Special Potash Mixture	10.00	....	4.00
Dissolved Bone and Potash.....	10.00	....	2.00
Vecoco Cotton Grower C. S. M.	9.00	2.26	2.00
Cotton Grower	9.00	2.26	2.00
Farmer's Choice	8.00	3.29	4.00
Special	8.00	3.29	4.00
High Grade Tobacco Fertilizer.....	8.00	2.47	10.00
Monarch Brand	8.00	1.65	5.00
Corn and Peanut Special	8.00	1.65	4.00
Special Peanut Grower	8.00	1.00	4.00
Peanut Grower	8.00	.82	4.00
Potash Mixture for Peanuts.....	8.00	....	4.00
Konqueror High Grade Truck Fertilizer.....	7.00	4.11	5.00
Pasquotank Truck	7.00	3.29	8.00
Invincible High Grade Fertilizer.....	6.00	4.11	7.00
Kittyhawk Truck Fertilizer	6.00	4.11	7.00
Dewberry Special	4.00	6.58	....
Sulphate of Ammonia .....	....	20.59	....
Nitrate of Soda .....	....	14.81	....
Fish Scrap	4.00	8.23	....
Muriate of Potash .....	....	....	48.00
Sulphate of Potash .....	....	....	48.00
Manure Salt .....	....	....	20.00
Kainit .....	....	....	12.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Blood .....	....	13.18	....
Floats	27.00	....	....
12 Per Cent Acid Phosphate.....	12.00	....	....
13 Per Cent Acid Phosphate.....	13.00	....	....
Electric Grain and Grass Grower.....	8.00	1.00	4.00
Crescent Potash Mixture	10.00	....	5.00
Peerless Corn, Wheat and Grass Grower.....	8.00	1.00	4.00
Monarch Wheat and Grass Grower.....	8.00	1.00	7.00
Valley Pride	8.00	1.65	4.00
Truck Crop Fertilizer	7.00	4.11	7.00
Enterprise High Grade	8.00	3.29	11.00
Potash Potato Producer	7.00	3.29	8.00
Formula 44 for Bright Wrappers and Smokers.....	7.00	2.55	3.20
Plant Bed and High Grade Tobacco Fertilizer.....	7.00	2.26	6.00
Special Truck Guano	6.00	4.11	7.00
High Grade Top Dresser.....	4.00	6.17	2.50
10 Per Cent Top Dresser Extra High Grade.....	4.00	8.23	4.00
Special Top Dresser .....	....	7.40	3.00
Johnson's Best	20.00	4.94	6.00
Sludge Acid Phosphate	14.00	....	....
Goodman's Special Potash Mixture.....	12.00	....	5.00
Home Comfort Acid Phosphate	12.00	....	....
Virginia 11-5 Bone and Potash.....	11.00	....	5.00
Ideal Crop Grower	10.00	2.47	3.00
Sovereign Crop Producer	10.00	1.65	2.00
Ford's Wheat and Corn Guano.....	10.00	.82	2.56
Great Texas Cotton Grower Soluble Guano.....	9.00	2.47	4.00
Jeffrey's High Grade Guano	9.00	2.47	3.00
N. and R.'s Best	9.00	2.47	3.00
Battle's Crop Grower	12.00	....	3.00
Southern Cotton Grower C. S. M.	9.00	2.26	2.00
Best's Special Cotton Grower.....	9.00	2.26	2.00
Powell's Special High Grade C. S. M.	9.00	2.26	3.00
Prolific Cotton Grower C. S. M.	9.00	2.26	2.00
White Stem C. S. M.	9.00	2.26	2.00
Standard Cotton Grower C. S. M.	9.00	2.26	2.00
Bumper Crop Grower	9.00	2.06	5.00
Cuban Special Mixture	9.00	1.85	4.00
Cock's Soluble High Grade Animal Bone.....	9.00	1.85	3.00
No. 923 Guano	9.00	1.65	3.00
Reliable Cotton Brand Fertilizer.....	9.00	1.65	3.00
North State Guano C. S. M.	9.00	1.65	1.00
Bigelow Crop Guano	9.00	.82	3.00
Bernhardt's Grain and Crop Guano.....	9.00	.82	3.00
McCormick's Wheat and Grain Guano.....	9.00	.82	3.00
Farmer's Friend Favorite Fertilizer Special.....	8.50	1.65	2.00
Nowell & Richardson's Special.....	8.00	3.29	4.00
Farmer's Success	8.00	2.47	4.00
Powhatan Crop Mixture	8.50	1.65	1.50
Pelican Peruvian Guano. Pelican Truck Grower and Top Dresser	8.00	4.11	5.00
Muse's Special	8.00	3.70	7.00
Croom's Crop Grower for All Crops.....	8.00	3.29	4.00
John F. Croom & Bro. Fish and Meal Mixture.....	8.00	3.29	4.00
Fish and Meal Mixture.....	8.00	3.29	4.00
Carr's Crop Grower	8.00	3.29	4.00
Lion High Grade Tobacco Fertilizer.....	8.00	2.47	4.00
Croom's Special Cotton Fertilizer Fish and Meal Mixture....	8.00	2.47	3.00
Menhaden Fish and Meal Mixture.....	8.00	2.47	3.00
Best's High Grade Cotton and Tobacco Guano.....	8.00	2.47	3.00
Diamond C. S. M. Guano.....	8.00	2.47	3.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Jumbo Peruvian Guano (Jumbo Crop Grower).....	8.00	2.47	3.00
Oldham's Special Compound for Tobacco (High Grade)....	8.00	2.47	3.00
Blake's Best	8.00	2.47	3.00
Royal High Grade Fertilizer.....	8.00	2.47	3.00
Special High Grade Tobacco Fertilizer C. S. M.	8.00	2.47	3.00
Adams' Special	8.00	2.47	3.00
Peruvian High Grade Tobacco Guano.....	8.00	2.47	3.00
Red Cliff High Grade Cotton Grower.....	8.00	2.47	3.00
Zeno Special Compound for Tobacco, High Grade.....	8.00	2.47	3.00
Gold Medal High Grade Tobacco Guano.....	8.00	2.47	3.00
Atlas Guano C. S. M.	8.00	2.47	2.50
3 Per Cent Special C. S. M. Guano No. 3.....	8.00	2.47	2.00
Pace's Special 5 Per Cent Potato Guano.....	8.00	1.65	5.00
The Harvester	8.00	.82	3.00
Pinnacle Grain Grower	8.00	.82	3.00
Pure Raw Bone, Total A. P.	20.60	3.71	....
Dissolved Animal Bone, Total A. P.	13.00	2.06	....
Myatt's Special High Grade Fertilizer.....	8.00	2.47	3.00
Admiral C. S. M.	8.00	2.47	2.50
Good Luck C. S. M.	8.00	2.47	2.50
Split Silk C. S. M.	8.00	2.47	2.50
Orange Grove Guano	8.00	2.26	2.50
Delta C. S. M. Guano.....	8.00	2.26	2.50
Royal Crown	8.00	2.26	2.00
Blue Star C. S. M.	8.00	2.06	3.00
Superlative C. S. M. Guano.....	8.00	2.06	3.00
Smith's Irish Potato Guano	8.00	1.65	10.00
Winston Special for Cotton	8.00	1.65	2.00
Diamond Dust C. S. M.	8.00	1.65	2.00
Plant Food C. S. M.	8.00	1.65	2.00
Wilson Standard C. S. M.	8.00	1.65	2.00
Ajax C. S. M. Guano.....	8.00	1.65	2.00
Farmer's Favorite Fertilizer C. S. M.	8.00	1.65	2.00
Jones' Grain Special	8.00	....	4.00
Virginia Bone Special	8.00	1.65	5.00
Potato and Cabbage Special	8.00	1.65	10.00
Money-maker for Cabbage and Potatoes.....	6.00	1.65	10.00
3-8-3 Tobacco Fertilizer	8.00	2.47	3.00
Long Leaf Tobacco Grower.....	8.00	3.29	5.00
3-9-3 Tobacco Fertilizer	9.00	2.47	3.00
Grain Mixture	9.00	1.03	2.00
Special Wheat Compound	8.00	....	4.00
8-5 Potash Mixture	8.00	....	5.00
Wythe County Potash Mixture.....	12.00	....	3.00
Climax Potash Mixture	16.00	....	2.00
Electric High Grade Special.....	10.00	3.29	4.00
Excelsior High Grade Special.....	8.00	2.47	5.00
Dewberry Special Extra High Grade.....	4.00	6.58	4.00
Special Grain Mixture	10.00	1.65	5.00
Concentrate Ammoniated	16.00	3.29	4.00
Concentrate Bone and Potash	20.00	....	4.00
Concentrate Acid Phosphate	24.00	....	....
Cotton Seed Meal .....	....	6.15	....
Maulsby's Fish Guano	8.00	1.65	3.00
Special Mixture	8.00	2.47	6.00
Best's High Grade Tobacco Fertilizer.....	9.00	2.47	7.00
Boon's Favorite	8.00	1.65	5.00
Blake's High Grade Cotton and Tobacco Guano.....	8.00	2.47	3.00
Old Dominion Special Mixture for Tobacco.....	8.00	3.29	4.00
Westfield High Grade Special Tobacco Grower.....	9.00	2.47	3.00
Gray Soil Special High Grade Tobacco Grower.....	9.00	2.47	3.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Alliance Acid Phosphate	16.00	....	....
Alliance Grain Fertilizer	8.00	1.65	2.00
Alliance Special Fertilizer	8.00	2.47	3.00
Alliance High Grade Manure.....	8.00	3.29	4.00
Clinton Special High Grade.....	5.00	2.47	5.00
Baltimore Special Mixture	9.00	.82	2.00
Star Brand Ground Slag (Total A. P.).....	17.00	....	....
Valentine Special	8.00	2.47	7.00
High Grade Southern Fertilizer Company's Scott's Cossypium Phospho.	10.00	1.65	2.00
Columbus Special Tobacco Guano.....	7.00	2.87	7.00
Formula 161 for Tobacco.....	8.00	3.29	4.00
5-6-7 Potato Fertilizer	5.00	4.94	7.00
5-6-5 Potato Fertilizer	5.00	4.94	5.00
Formula 101 Tobacco Mixture.....	8.00	2.47	3.00
6-4-7 Tobacco Mixture	6.00	3.29	7.00
Sir Walter Tobacco Mixture	4.00	3.29	6.00
Tilley's Special Tobacco Grower.....	10.00	2.83	8.00
Paschall's Top Dresser	9.50	4.51	....
Spring Dewberry Fertilizer	8.00	1.65	12.00
Butler's Special	6.00	3.29	5.00
8-4-7 Complete Fertilizer	8.00	3.29	7.00
Official High Grade	11.00	1.65	1.00
Morgan's Special	12.00	1.65	1.00
V. C. Vanorca Top Dresser	4.00	6.18	2.00
8-4-0 Ammoniated Superphosphate	8.00	3.29	....
9-3-0 Ammoniated Superphosphate	9.00	2.47	....
10-2-0 Ammoniated Superphosphate	10.00	1.65	....
10-2.50-0 Ammoniated Superphosphate	10.00	2.06	....
10-3-0 Ammoniated Compound	10.00	2.47	....
10-4-0 Ammoniated Compound	10.00	3.29	....
10-5-0 Ammoniated Compound	10.00	4.11	....
12-2-0 Ammoniated Compound	12.00	1.65	....
Popular Grain Grower	9.00	2.47	1.00
Carolina Grain Special	9.00	3.29	1.00
Fall Crop High Grade Ammoniate.....	9.00	3.29	2.00
Durham Grain Application	10.00	1.65	1.00
Eureka Grain and Crop Grower.....	10.00	2.47	1.00
Piedmont High Grade Guano.....	10.00	2.47	2.00
Pride of North Carolina Guano.....	10.00	3.29	1.00
Plantation Special Mixture	10.00	3.29	2.00
Big Yield Crop Fertilizer.....	12.00	1.65	2.00
1231 Complete Fertilizer	12.00	2.47	1.00
Heracles Guano	12.00	2.47	2.00
Duke Special F. and M. Mixture.....	9.00	2.26	5.00
Duke Exceelsior Cotton Grower.....	9.00	2.26	5.00
Special Formula	8.00	4.11	10.00
12-2 Bone and Potash.....	12.00	....	2.00
Big Boss	12.00	1.65	1.00
Big Chief	12.00	1.65	1.00
Gladiator High Grade Truck Fertilizer.....	7.00	4.11	5.00
V. C. Complete Fertilizer.....	8.00	3.29	6.00
Whitley's Special	9.00	3.29	4.00
V. C. Formula 101 Special for Cotton.....	8.00	2.47	3.00
Elliott's Special Fish Brand.....	8.00	1.65	2.00
Fish Compound	8.00	1.65	2.00
Mann's Special for Tobacco.....	8.00	2.47	3.00
Mann's Fish and Meal Guano.....	8.00	2.47	3.00
Hoffman's Special Guano.....	8.00	3.29	2.00
5 Per Cent Tobacco Guano.....	8.00	2.47	5.00
Sweepo Special	6.00	1.65	5.00

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Titan Truck Fertilizer	7.00	4.11	6.00
Potash Special for Sweet Potatoes.....	8.00	3.29	5.00
Wheeler's Special Guano	8.00	3.29	2.00
Durham High Grade Top Dresser.....	....	8.23	2.00
V. C. Complete Top Dresser.....	4.00	8.23	2.00
Trojan Reliable Guano	12.00	3.29	1.00
Imperial Crop Producer	12.00	3.29	2.00
Planter's Reliable Guano	14.00	1.65	1.00
Southern Favorite	14.00	2.47	1.00
High Grade Ammoniated Compound.....	14.00	3.29	1.00
Eleven and One Bone and Potash.....	11.00	....	1.00
Twelve and One Bone and Potash Mixture.....	12.00	....	1.00
Fidelity Grain Compound	12.00	....	1.50
Sovereign Bone and Potash.....	14.00	....	1.00
Tar Heel Bone and Potash Compound.....	14.00	....	1.50
Best Yet Bone and Potash.....	14.00	....	2.00
V. C. 6-7-1 Special Truck Fertilizer.....	6.00	5.76	1.00
V. C. 7-5-1 Special Truck Fertilizer.....	7.00	4.11	1.00
V. C. 8-4-2 for Plant Beds Only	8.00	3.29	2.00
V. C. 8-4-0 Ammoniated Compound.....	8.00	3.29	....
V. C. 6-4-1 Complete Fertilizer.....	6.00	3.29	1.00
V. C. 8-3-2 for Plant Beds Only	8.00	2.47	2.00
V. C. 9-2 $\frac{3}{4}$ -1 Complete Fertilizer.....	9.00	2.26	1.00
V. C. 6-7-0 Compound Truck Fertilizer.....	6.00	5.76	....
V. C. 7-5-0 Compound Truck Fertilizer.....	7.00	4.11	....
V. C. 8-4-1 Complete Fertilizer.....	8.00	3.29	1.00
V. C. 6-4-2 for Plant Beds Only	6.00	3.29	2.00
V. C. 6-4-0 Ammoniated Compound.....	6.00	3.29	....
V. C. 8-3-1 Complete Fertilizer.....	8.00	2.47	1.00
V. C. 9-2 $\frac{3}{4}$ -2 for Plant Beds Only	9.00	2.26	2.00
V. C. 8-2-2 for Plant Beds Only	8.00	1.65	2.00
A. A. Guano, Revised	8.00	2.47	1.00
Gold Medal Brand Guano, Revised	8.00	2.47	1.00
Farmer's Friend High Grade Fertilizer, Revised.....	8.00	2.47	1.00
Richmond Brand Guano, Revised.....	8.00	2.47	1.00
Bull Dog Soluble Guano, Revised.....	8.00	2.47	1.00
Royal High Grade Fertilizer, Revised.....	8.00	2.47	1.00
Diamond C. S. M. Guano, Revised.....	8.00	2.47	1.00
Blake's Best C. S. M., Revised.....	8.00	2.47	1.00
Menhaden Fish and Meal Mixture, Revised.....	8.00	2.47	1.00
Croom's Special Cotton Fertilizer Fish and Meal Mixture, Revised	8.00	2.47	1.00
Owl Brand Guano for Tobacco. Revised.....	8.00	2.47	2.00
Yellow Leaf Tobacco Grower, Revised.....	8.00	2.47	2.00
Amazon High Grade Special Guano, Revised.....	8.00	2.47	2.00
Bright Leaf Tobacco Grower, Revised.....	8.00	2.47	2.00
Farmer's Friend Special Tobacco Fertilizer, Revised.....	8.00	2.47	2.00
Traver's Big Leaf Tobacco Grower, Revised.....	8.00	2.47	2.00
Oldham's Special Compound for Tobacco, Revised.....	8.00	2.47	2.00
Myatt's Special High Grade Fertilizer, Revised.....	8.00	2.47	2.00
Gold Medal High Grade Tobacco Guano, Revised.....	8.00	2.47	2.00
Peruvian High Grade Tobacco Guano, Revised.....	8.00	2.47	2.00
Capital Tobacco Fertilizer, Revised.....	8.00	3.29	2.00
V. C. Special, Revised.....	8.00	3.29	2.00
Old Dominion Soluble Guano, Revised	9.00	1.65	1.00
Farmer's Friend Fertilizer, Revised.....	9.00	1.65	1.00
Queen of the Harvest C. S. M., Revised.....	9.00	1.65	1.00
Little Giant Grain and Grass Grower, Revised.....	9.00	2.47	1.00
Durham Ammoniated Compound	10.00	1.65	....
Old Dominion Ammoniated Compound.....	10.00	1.65	....
V. C. Ammoniated Compound.....	10.00	1.65	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Reliable Ammoniated Compound	10.00	1.65	....
Bone and Fish Ammoniated Compound.....	8.00	3.29	....
Quick Step Ammoniated Compound.....	8.00	3.29	....
Cotton Ammoniated Compound	9.00	2.47	....
Blue Ribbon Ammoniated Compound.....	9.00	2.47	....
Morgan's Ammoniated Compound	9.00	2.47	..
Victor Ammoniated Compound	10.00	2.47	..
Alpine Ammoniated Compound	10.00	2.47	..
Norfolk Ammoniated Compound	10.00	2.47	....
Farmer's Pride Ammoniated Compound.....	10.00	3.29	....
Almont Ammoniated Compound	10.00	3.29	....
Capital Ammoniated Compound	6.00	5.76	....
Planter's Ammoniated Compound	6.00	5.76	....
Monarch Ammoniated Compound	12.00	1.65	....
Harvester Ammoniated Compound	12.00	1.65	....
Travers' Ammoniated Compound	12.00	1.65	....
Eureka Ammoniated Compound	12.00	1.65	....
N. C. Ammoniated Compound	6.00	3.29	....
Alliance Ammoniated Compound	6.00	3.29	....
Trucker's Ammoniated Compound.....	6.00	5.76	1.00
Special Ammoniated Compound.....	6.00	5.76	1.00
Trucker's Special Ammoniated Compound.....	7.00	4.94	1.00
Bumper Crop Grower, Revised.....	9.00	2.47	1.00
V. C. Farmer's Choice, Revised.....	9.00	2.47	1.00
Excelsior Ammoniated Compound.....	6.00	5.76	....
Mammoth Ammoniated Compound.....	10.00	1.65	....
Powell's Special High Grade, Revised.....	9.00	2.26	2.00
Charlotte Oil and Fertilizer Company's Oliver's Perfect Wheat Grower, Revised	11.00	2.47	....
V. C. Special Grain Mixture, Revised.....	10.00	.82	1.00
N. C. Farmer's Alliance Official, Revised.....	8.00	2.06	2.00
V. C. Farmer's Blend Fertilizer.....	9.00	1.65	1.00
V. C. Conqueror High Grade Truck Fertilizer, Revised.....	7.00	4.11	1.00
V. C. Formula No. 161 for Tobacco, C. S. M., Revised.....	8.00	3.29	2.00
Split Silk C. S. M. Guano, Revised.....	8.00	2.47	2.00
V. C. Farmer's Success C. S. M., Revised.....	8.00	2.47	2.00
Old Hickory Ammoniated Compound.....	10.00	2.06	....
V. C. Peerless Brand Guano.....	8.00	3.29	1.00
O. D. 10 Per Cent Truck Fertilizer, Revised.....	5.00	8.23	2.00
Tinsley's 10 Per Cent Truck Guano, Revised.....	5.00	8.23	2.00
V. C. 6-5-0 Ammoniated Superphosphate.....	6.00	4.11	....
V. C. Dunnington's Special Formula for Tobacco, Revised ..	9.00	2.26	2.00
V. C. Delta C. S. M. Guano, Revised.....	8.00	2.26	2.00
V. C. Special H. G. Tobacco Fertilizer, C. S. M., Revised...	8.00	2.47	2.00
V. C. Person County Special for Tobacco	8.50	2.26	2.00
V. C. Mangum's Special for Tobacco.....	8.00	1.65	2.00
Wheeler's Special Top Dresser.....	4.00	8.23	....
Wheeler's 6-4-0 Ammoniated Compound	6.00	3.29	....
V. C.-C. Co.'s 4-10-0 Top Dresser	4.00	8.23	....
V. C.-C. Co.'s 6-10-0 Top Dresser	6.00	8.23	....
V. C.-C. Co.'s 8-5-0 Ammoniated Superphosphate.....	8.00	4.11	....
Tilley's Special Tobacco Grower, Revised.....	10.00	2.88	2.00
V. C. Amazon H. G. Special Tobacco Guano, Revised.....	8.00	2.47	2.00
V. C. 7-6-0 Ammoniated Superphosphate	7.00	4.94	....
V. C. Ground Phosphate Rock (Total A. P.).....	28.00	....	....
V. C. 4-6-0 Top Dresser	4.00	4.94	....
V. C. 4-7½-0 Top Dresser	4.00	6.17	....
V. C. 4-8-0 Top Dresser	4.00	6.58	....
V. C. Croom's Special Compound	9.00	3.29	....
V. C. North Carolina Trucker	8.00	4.11	1.00
V. C. 7-4-0 Ammoniated Compound	7.00	3.29	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
V. C. Carter's High Grade Top Dresser.....	2.00	7.40	1.00
V. C. Blue Ridge Ammonia Compound.....	10.00	1.65	....
V. C. 12-4-0 Ammoniated Compound.....	12.00	3.29	....
V. C. Ammoniated Superphosphate Special.....	8.50	2.88	....
V. C. Wayne County Standard C. S. M.	6.00	2.47	2.00
V. C. 7-5-0 Ammoniated Superphosphate.....	7.00	4.11	....
V. C. Special 3-9-0 Top Dresser.....	3.00	7.40	....
V. C. 12-3-0 Ammoniated Compound.....	12.00	2.47	....
V. C. 3-8-1 Top Dresser.....	3.00	6.58	1.00
V. C. 0-10-1 Top Dresser.....	....	8.23	1.00
Johnson's Improved Top Dresser.....	4.00	8.23	....
V. C. 9-3.50-0 Ammoniated Compound.....	9.00	2.88	....
V. C. Derby's Special.....	8.00	4.94	3.00
V. C. 20 Acid Phosphate.....	20.00	....	....
Adams' Special Formula.....	8.00	2.06	3.00
J. J. White's Gold Eagle Brand.....	8.00	2.47	3.00
V. C. Special B. and B. Cotton Grower C. S. M.	9.00	2.26	2.00
J. J. White's Gold Eagle Brand for Tobacco.....	8.00	2.47	3.00
V. C. 7-5-2 Guano.....	7.00	4.11	2.00
V. C. 6-5-2 Guano.....	6.00	4.11	2.00
V. C. 8-5-2 Guano.....	8.00	4.11	2.00
V. C. Buck Island Guano.....	9.00	2.47	2.00
V. C. Red Land Crop Grower.....	10.00	1.65	....
V. C. Truck Guano.....	7.00	4.94	2.00
V. C. High Grade Tankage.....	....	8.23	....
V. C. 6-5-1 Guano.....	6.00	4.11	1.00
V. C. 8-7-0 Ammoniated Superphosphate.....	8.00	5.76	....
Tinsley's 8-5-0 Ammoniated Superphosphate.....	8.00	4.11	....
Tinsley's 6-5-0 Ammoniated Superphosphate.....	6.00	4.11	....
V. C. P. G. Old Kentucky H. G. Tobacco Manure, Revised..	8.00	2.47	2.00
Mann's Fish and Meal Compound.....	8.00	3.29	....
V. C. 11-1-0 Ammoniated Compound.....	11.00	.82	....

VENABLE FERTILIZER COMPANY,

RICHMOND, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Venable's Truck Special.....	7.00	4.11	1.00
Planter's Tobacco Special.....	8.00	3.29	1.00
Wrapper Tobacco Special.....	9.00	2.47	1.00
Venable's Tobacco Special.....	8.00	2.47	2.00
High Grade Tobacco Special.....	8.00	2.47	1.00
Venable's High Grade Guano.....	8.00	2.47	1.00
No. 1 Tobacco Special.....	9.00	2.06	1.00
No. 2 Tobacco Special.....	9.00	1.65	1.00
Planter's Bone Fertilizer.....	8.00	1.65	2.00
Venable's B. B. P. Manure.....	9.00	1.65	1.00
Planter's Bone Special.....	9.00	1.65	1.00
Ideal Corn Special.....	12.00	1.00	1.00
Venable's Corn, Wheat and Grass Fertilizer.....	10.00	.82	1.00
Venable's Ammoniated Phosphate 10-4-0.....	10.00	3.29	....
Venable's Ammoniated Phosphate 6-4-0.....	6.00	3.29	....
Venable's Ammoniated Phosphate 10-3-0.....	10.00	2.47	....
Venable's Ammoniated Phosphate 10-2 ½-0.....	10.00	2.06	...
Venable's Ammoniated Phosphate 12-2-0.....	12.00	1.65	....
Venable's Ammoniated Phosphate 9-3-0.....	9.00	2.47	....
Venable's Ammoniated Phosphate 8-4-0.....	8.00	3.29	....
Venable's Ammoniated Phosphate 9 ½-2 ½-0.....	9.50	2.06	....

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Planter's Bone Guano	10.00	1.65	....
Ideal Corn Guano	12.00	1.00	....
Ideal Crop Guano	11.00	.82	....
Venable's Best Acid Phosphate.....	16.00	....	....
High Grade Acid Phosphate.....	14.00	....	....
Venable's Dissolved Bone	13.00	....	....
Venable's Standard Acid Phosphate.....	12.00	....	....
Sulphate of Ammonia .....	....	19.75	....
Nitrate Soda .....	....	14.80	....
Venable's Top Dresser	4.00	8.23	4.00
Venable's 10 Per Cent Top Dresser.....	6.00	8.23	2.00
Special Top Dresser .....	....	7.40	3.00
Majestic Top Dresser	4.00	6.17	2.50
Venable's 6-6-6 Manure	6.00	4.94	6.00
Venable's 5 Per Cent Trucker.....	8.00	4.11	5.00
Venable's 4 Per Cent Trucker.....	8.00	3.29	4.00
Venable's Sovereign Guano	8.00	3.29	4.00
Venable's Special Tobacco Fertilizer.....	8.00	3.29	6.00
Venable's Carolina Favorite	9.00	2.47	6.00
Venable's Choice Fertilizer	8.00	2.47	3.00
Venable's High Grade Tobacco Fertilizer	8.00	2.47	3.00
Venable's High Grade Cotton Grower.....	8.00	2.47	3.00
Venable's 3-9-3 Tobacco Fertilizer	9.00	2.47	3.00
Farmers' Union High Grade Tobacco Guano.....	8.00	2.47	3.00
Roanoke Meal Mixture	9.00	2.26	2.00
Roanoke Mixture	9.00	2.26	2.00
Venable's Roanoke Special	8.00	2.06	3.00
Venable's Alliance Tobacco Manure No. 1.....	8.00	2.06	3.00
Venable's Cotton Grower	8.00	2.06	3.00
Our Union Tobacco Fertilizer.....	8.00	1.65	4.00
Our Union Special Fertilizer.....	8.00	1.65	2.00
Venable's Meal Mixture	8.00	1.65	2.00
Venable's Ideal Manure	8.00	1.65	5.00
Venable's Majestic Guano	9.00	1.65	3.00
Venable's Alliance Tobacco Manure No. 2.....	8.00	1.65	2.00
Farmers' Union Special Tobacco Fertilizer.....	8.00	1.65	2.00
Venable's Corn Special Fertilizer.....	12.00	1.00	2.00
Venable's Peanut Special	8.00	.82	4.00
Venable's Grain Special	8.00	.82	4.00
Venable's Wheat Grower	9.00	.82	2.00
Majestic Grain Guano	9.00	.82	3.00
Venable's Majestic Bone and Potash.....	12.00	....	5.00
High Grade Bone and Potash Mixture	10.00	....	4.00
Bone and Potash Mixture.....	14.00	....	2.00
Venable's Alliance Bone and Potash Mixture.....	8.00	....	4.00
Venable's Peanut Grower	8.00	....	4.00
Bone and Potash Mixture.....	10.00	....	2.00
Bone and Potash Mixture.....	12.00	....	2.00
Bone and Potash Mixture.....	11.00	....	1.00
Pure Raw Bone Meal.....	22.50	3.70	....
Pure Animal Bone	25.00	2.47	....

WULBERN FERTILIZER COMPANY,
CHARLESTON, S. C.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Wulbern's Dissolved Bone	16.00	....	....

WINBORNE GUANO COMPANY,
NORFOLK, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
Nitrate of Soda .....	....	15.00	....
Ground Fish Tankage .....	....	8.20	....
High Grade 16 Per Cent Acid Phosphate.....	16.00	....	....
Special 2-8-2 Tobacco Guano.....	8.00	1.65	2.00
Special 3-8-2 Tobacco Guano.....	8.00	2.47	2.00
Special 7 Per Cent Guano.....	6.00	5.75	....
Special 5 Per Cent Guano.....	7.00	4.10	....
Special Triumph Guano	8.00	3.30	....
Special King Guano	9.00	2.47	....
Special Excelsior Guano	10.00	1.65	....

T. W. WOOD & SONS,
RICHMOND, VA.

<i>Name of Brand</i>	<i>Available Phos. Acid Per Cent</i>	<i>Nitrogen Per Cent</i>	<i>Potash Per Cent</i>
High Grade Trucker Fertilizer.....	8.00	4.93	1.00
Market Grower Fertilizer	8.00	3.29	1.00
Vegetable Fertilizer	8.00	2.47	1.00
Potato Fertilizer	9.00	1.65	1.00
Grain and Grass Fertilizer.....	9.00	1.65	1.00
Corn Fertilizer	10.00	1.00	1.00
Wheat Fertilizer	10.00	1.00	1.00
Wood's Lawn Enricher	9.00	2.47	1.00
Wood's Pure Bone Meal.....	23.00	3.70	....
Standard Bone Meal	22.00	2.47	....
Acid Phosphate	14.00	....	....
Standard High Grade Acid Phosphate.....	16.00	....	....
Nitrate of Soda .....	....	14.80	....
Ground Basic Slag	17.00	....	....
Wood's Standard Vegetable Fertilizer.....	8.00	2.47	3.00
Wood's Standard Potato Fertilizer.....	8.00	2.47	4.00

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COUNTY SOIL REPORT, No. 1

REPORT ON
MECKLENBURG COUNTY SOILS, AGRICULTURE
AND INDUSTRIES



MAP SHOWING SOIL SURVEY AREA OF MECKLENBURG COUNTY

This work was done by the Division of Agronomy of the State Department of Agriculture in coöperation with the Bureau of Soils of the Federal Department of Agriculture.

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*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In coöperation with Bureau of Plant Industry, United States Department of Agriculture.

LETTER OF TRANSMITTAL

WEST RALEIGH, N. C., March 23, 1917.

SIR:—Herewith I transmit a Report on the Soils, Agriculture, and Industries of Mecklenburg County. The data on the soils included in the report were gathered in a systematic soil survey of the county made in 1910 in coöperation with the Bureau of Soils of the United States Department of Agriculture. .

In the recommendations with reference to the soils and their plant-food requirements, we have been largely guided by the results secured in carefully conducted soil-type field experiments in Mecklenburg and adjoining counties.

I would recommend that this report be issued as County Report, No. 1.

Respectfully submitted,

C. B. WILLIAMS,

Chief, Division of Agronomy.

Approved:

W. A. GRAHAM.

Commissioner of Agriculture.

REPORT ON MECKLENBURG COUNTY SOILS, AGRICULTURE AND INDUSTRIES

BY C. B. WILLIAMS, W. E. HEARN, J. K. PLUMMER, AND W. F. PATE.

Mecklenburg County lies on the southern boundary in the western part of North Carolina. It is bounded on the north by Iredell County, on the east by Cabarrus and Union counties, on the south by Union County and South Carolina, and on the west by South Carolina and Gaston and Lincoln counties, which are separated from Mecklenburg by the Catawba River. The county is very irregular in shape. In extreme dimensions it is 36 miles from north to south and 27 miles from east to west, and contains 543 square miles, or 347,520 acres.



FIG. 1. Showing the gently rolling nature of the soils of the county.

TOPOGRAPHY

The topography or general surface features of Mecklenburg County consist dominantly of a series of gently rolling to almost level interstream areas, which become more rolling, broken and hilly as the large streams are approached. Some of the more level and undulating areas are situated to the south of Shopton, where a basinlike area is developed; others are to the southwest of Providence. The level to gently rolling interstream areas are numerous throughout the county, but some of the

more important ones lie between Matthews and Mint Hill, between Charlotte and Davidson, around Sharon Church, south of Bethel Church, and west of Hopewell Church. The more rolling, hilly, and uneven surface areas are developed on the bluffs along the Catawba River, south of Clarke Creek, along the Cabarrus-Mecklenburg line to Pine Ridge, and north of Mallard Creek and near many of the larger streams. In the latter localities, especially along the Catawba River and some of the larger streams, erosion has been very pronounced, resulting in the formation of gullies and deep ravines.

ELEVATIONS

The elevation above sea level varies considerably in different parts of the county. There is more than 300 feet difference between the bottomlands along the Catawba River on the South Carolina county line and the high uplands near Davidson. The elevation on the Catawba River along the north boundary of the county is 710 feet. At the south boundary it is 520 feet; at Thompson's Store 765 feet; at Charlotte 750 feet; at Juneau 574 feet, and at Pineville 570 feet above sea level.

DRAINAGE

The general slope and drainage of the county is to the south and southwest, except along the eastern border, where it is to the east toward Rocky River. There is a ridge which extends from the northern boundary toward Derita, thence to Hickory Grove Church, and on by Mint Hill. All of the water east of this ridge flows into Rocky River, and all to the west and south of it, which includes the greater portion of the county, flows west and south, emptying directly or indirectly into the Catawba River.

The Catawba River flows south along the western border of the county, and falls 190 feet between the northern end and the southern boundary of the county. All the western, central, and southern portions are drained by this river and its principal tributaries: the Davidson, McDowells, Long, Paw, Steele, Little Sugar, Sugar, Brier, McMullen, McAlpine, and Four-mile creeks. Along the northeast corner flows the Rocky River, and the principal tributaries entering it are the West Branch, Rocky River, Clarks, Mallard, Back, Reedy, and Clear creeks. These streams, together with their numerous tributaries in the form of branches and streamlets, ramify all portions of the county so thoroughly that practically every farm is directly connected with one or more natural drainage ways. The larger streams have cut deep, narrow valleys flanked by rather steep slopes. These streams are fairly swift flowing and are still cutting their channel in an endeavor to reach sea level. Considerable water-power can be developed along the rivers and some of the creeks, and even now some of the gristmills and cotton gins are operated by water-power, while cotton mills are being run by water-power along the Catawba River.

SETTLEMENT

Mecklenburg County was formed in 1762, being largely settled by Scotch, with some Irish, Germans, and English. From Pennsylvania and Virginia came the Scotch and Irish and then the Germans. From Charleston and Georgetown, South Carolina, came the English. Other English settlers also came from eastern North Carolina. The people of the county are intelligent, labor-loving, industrious, and patriotic. They early felt their oppression by the English Crown, and a band of them organized and declared war against the English Government. As a result of this the Mecklenburg Declaration of Independence was adopted and signed May 20, 1775, more than one year prior to that promulgated by the Congress at Philadelphia, July 4, 1776. The people of Mecklenburg celebrate this event annually on May 20, and this day is a State holiday. Excepting the city of Charlotte, the population is well distributed throughout the county. There are, however, some large tracts which are undeveloped and some abandoned old fields which could be divided and converted into a productive condition. The county, though one of the most populous in the State, could easily support several times the present population. Throughout the county there are a large number of college graduates who are farming according to the latest and most scientific methods. The results secured by these men are indicative of what the soils are capable of producing and, at the same time, give encouragement to the remaining farming classes.

INDUSTRIES

The industries in Mecklenburg County are numerous and varied. There are twenty cotton mills in operation in the county. Charlotte is the center of the textile industry of the United States. Within a radius of 100 miles are to be found more than three hundred cotton mills containing more spindles and more looms than anywhere else in the world. Within a radius of 50 miles of Charlotte are located four immense hydro-electric plants generating a total of more than one-fourth million electric horse-power. Electricity is being transmitted not only all over the county, but throughout a large part of this section in North Carolina, and many of the cotton mills and other manufactories are operated by this power. Other manufactories too numerous to mention are operated in Charlotte.

RAILWAY, TRACTION, AND ROAD CONSTRUCTION

Mecklenburg County is favored with excellent railroad facilities. The county-seat, Charlotte, is one of the leading railroad centers of the South, having four railway lines entering the city, affording both fast freight and passenger service. More than sixty passenger trains arrive and leave Charlotte within the day, while fast through freight service is maintained on all lines entering the city. The main line of the Southern



FIG. 2. Drainage ditch with corn in the background meadow land.



FIG. 3. Corn on drained meadow land. Three years previous was waterlogged valley.

Railway from Washington to Atlanta and the Seaboard Air Line from Wilmington to Rutherfordton pass through the county. The Norfolk Southern enters the county from the east and the Piedmont Northern, a traction line, enters from the west.

In 1884 the building of macadam roads was begun, and now there are more than 225 miles of well-graded and macadamized roads within its borders. It has been one of the foremost counties in the good roads movement in the South. Most of these roads radiate from Charlotte and traverse all sections of the county. In some instances, cross links have been constructed.

TOWNS

Charlotte, the county-seat of Mecklenburg County, had a population of 34,104, according to the 1910 census, but the growth of this city has been rapid in the last five years and it now probably has a population around 50,000. Davidson, Huntersville, Cornelius, Pineville, and Matthews are towns having a population from 500 to 1,500.

The county is well supplied with good schoolhouses and many fine churches. A large number of beautiful country homes are seen. Rural free delivery covers all parts of the county thoroughly and telephone lines connect nearly every home with the city of Charlotte and the outside world.

Charlotte is the general market for the products of the farm. Cotton finds a ready sale here and at the various cotton mills throughout the county. There is a great demand by the residents of Charlotte and those living in the smaller towns for butter, milk, eggs, chickens, fruits, and the general market garden products. The demand for these products far exceeds the supply, and excellent opportunities are offered to those who would engage in truck farming, dairying, or poultry raising.

CLIMATE

The Weather Bureau has a station located in Charlotte, from the records of which the data given in the appended table have been compiled. An examination of these records will reveal the fact that the rainfall, ranging from 35 to 68 inches annually, is ample and is well distributed throughout the year. There need never be a crop failure on account of inadequate rainfall if conditions continue as favorable in the future as they have in the past. The range in temperature is from 102° F. on the hottest day to - 5° F. for the coldest winter day, with an annual mean temperature of 60° F. The spring and fall months are almost ideal for farm work, while the summers are not excessively hot nor the winters extremely cold.

The average date of the last killing frost in the spring is April 1, and of the first in the fall is November 4. This gives a growing season of about 215 days—a sufficiently long time for the production of a wide range of crops.

Mecklenburg County, owing to its high elevation, topography, and good surface drainage, and also to the fact that good spring and well water can be had in all parts of the county, possesses a healthful and invigorating climate. Around many of the farm houses excellent sanitary precautions are taken, and as a result cleanliness and neatness prevail. Some, however, pay too little attention to these matters.

The following table gives the salient features of climatic data in detail:

NORMAL MONTHLY, SEASONAL, AND ANNUAL TEMPERATURE AND PRECIPITATION AT CHARLOTTE.

Month	Temperature			Precipitation			
	Mean	Absolute Maximum	Absolute Minimum	Mean	Total Amount for the Dryest Year	Total Amount for the Wettest Year	Snow, Average Depth
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
December.....	43	76	—5	3.8	1.9	5.7	2.2
January.....	41	77	—1	4.3	2.3	7.6	1.9
February.....	44	79	—5	4.6	5.4	6.4	2.9
Winter.....	43			12.7	9.6	19.7	7.0
March.....	51	85	14	4.8	1.6	9.2	.6
April.....	59	94	26	3.4	1.9	5.4	.1
May.....	69	97	38	3.9	1.7	4.8	.0
Spring.....	60			12.1	5.2	19.4	.7
June.....	76	102	45	4.6	3.4	9.5	.0
July.....	79	102	55	5.3	6.4	7.9	.0
August.....	77	100	53	5.2	1.0	2.1	.0
Summer.....	77			15.1	10.8	19.5	.0
September.....	72	99	38	3.3	4.7	3.6	.0
October.....	61	92	30	3.4	1.0	1.5	T.
November.....	51	80	18	3.0	3.7	4.7	T.
Fall.....	61			9.7	9.4	9.8	T.
Year.....	60	102	—5	49.6	35.0	68.4	7.7

AGRICULTURAL STATISTICS

The value of farm property in Mecklenburg County at the last census period was over \$15,000,000. This was an increase of 135 per cent over the previous census. The farm property values are distributed as follows:

Land	69.1 per cent
Buildings	18.3 per cent
Implements and machinery.....	3.0 per cent
Domestic animals	9.6 per cent

Eighty-three and three-tenths per cent of the land area is in farms. Fifty-six per cent of the farm land is improved. The average size of farms is 71.7 acres. The population in 1910 was 67,031.

AGRICULTURAL DEVELOPMENT

The first land grants for the territory now included in Mecklenburg County date back to 1749. The early settlers began to produce small grain, corn, hogs, cattle, and sheep. Flax, indigo, and some tobacco for home use were also grown. Between 1782 and 1795 considerable areas of cotton were planted. Cattle raising became of more importance, and most of the animals were driven to Charleston. According to the early history, the period between 1800 and 1810 was one of the most prosperous prior to the Civil War. Mecklenburg was the leading county in North Carolina in the development of cotton growing.

Large plantations were the rule, and these ranged in size from 2,000 to 5,000 acres. Land was plentiful and cheap and the planter did not give much attention to intensive farming or to the building up of the soil, and when a field began to show a decided decline in yields it was abandoned or turned out and a new field cleared to take its place. On some of the uplands wild pea vines and grasses flourished, and this afforded excellent grazing for cattle and sheep. Immediately after the Civil War Mecklenburg County was favored by home-seekers. Money was scarce and the people through necessity began to increase the acreage devoted to cotton, the money crop, and from 1865 to 1880 the number of bales of cotton produced had increased from 6,000 to 19,000.

PRESENT AGRICULTURE

The agriculture of Mecklenburg County consists at the present time in the production of cotton, corn, oats, crimson clover, cowpeas, wheat, rye, market gardening, and dairying.

Cotton, being the principal money crop, is the most important crop grown, being more than 35 per cent of all the crops. Its production is distributed throughout the county upon practically all of the upland soils. The yields under normal conditions range from one-fourth to more than one bale per acre.

Corn, comprising almost 24 per cent of the cultivated land of the county in crops, is the second crop of importance, and is grown to more or less extent on every type of soil throughout the county. The average yield is about 20 bushels, although 40 to 50 bushels can be obtained by proper methods of preparation, cultivation, and liberal fertilization. Frequently as much as 75 bushels per acre have been obtained. The corn grown in Mecklenburg County is used principally as the subsistence crop for work stock and hogs. The amount grown is insufficient to meet the local demands throughout all parts of the county, to say nothing of the demand of the cities.

Oats rank third in importance. The yields range from 15 to 40 bushels per acre for seed oats. The acreage devoted to wheat has materially decreased during the past decade. Crimson clover is grown to a limited extent, and when cut for hay yields from 1 to $1\frac{1}{2}$ tons per acre. Cowpeas, too, are grown to some extent on practically every farm, and when the vines are cut for hay about 1 to $1\frac{1}{2}$ tons per acre is



FIG. 4. Showing native forest.

secured. Frequently about one gallon of sorghum cane seed is sown with the peas. The Whip-poor-will and Iron cowpeas seem to be the favorite variety as the latter is somewhat immune to diseases. Johnson grass is grown in the southern part. Some alfalfa is grown with success and small fields of rape are cultivated.

Since 1910 there has been a revival in the sowing of wheat, and within the last two or three years considerable acreage has been devoted to this crop. The yields range about 8 to 15 bushels per acre, with

yields of 30 bushels being recorded. Small acreages are usually sown to rye, but most of this crop is either pastured or turned under as a soil improver and no yields of grain were secured.

Dairying and market gardening are carried on in the vicinity of Charlotte for the purpose of supplying, in part, the local demand for these products. Seven creamery routes ship about 8,000 pounds of butter fat per month. There is probably 10 per cent more live stock in the county now than in 1910. Poultry raising on a small scale is carried on and brings in a considerable revenue to farmers.

In addition to the products just enumerated there is grown a considerable quantity of sweet potatoes, Irish potatoes, cabbages, and other vegetables, a few strawberries and some peanuts. Watermelons and cantaloupes are grown commercially in a small way and are ready money crops. Patches of sorghum are grown and manufactured into sirup for home use. Around nearly every farm are found a few apple trees, peaches, pears, and occasionally cherries and figs. Hogs for supplying needs of the homes are raised on most every farm, and occasionally some are sold at the local markets.

RECOGNITION GIVEN ADAPTATION OF SOILS

It is generally recognized by the farmers that the meadow or bottom-lands along the streams are especially suited to the production of corn, while the Congaree fine sandy loam produces extra large watermelons. They recognize that the Durham sandy loam and the lighter areas of the Cecil sandy loam are well adapted to sweet potatoes, peanuts, and early truck crops, while strawberries, cabbage, Irish potatoes, sweet corn, and tomatoes do best on the slightly heavier soils. It is also recognized that the Cecil clay loam, Iredell loam, and the Mecklenburg clay loam soils are well suited to the growing of cotton, corn, wheat, oats, and clovers. The Iredell and Mecklenburg soils are especially well suited to Johnson grass, and the Iredell loam especially to oats. Around Rock Hill, South Carolina, across the State line, the red clay of the Mecklenburg soils is used for the production of alfalfa on a commercial scale, and is a profitable crop.

PREPARATION AND CULTIVATION OF SOILS

In recent years there has been considerable improvement made in the preparation of land. Many farmers, however, plow their land shallow and do not produce the mellow seed-bed before the crops are planted. The best farmers now plow their land fairly deep, harrow it two or three times, and give the crops from three to five cultivations. Some disk the corn land and drill in the wheat. Many others break this land to a depth of 5 to 8 inches, harrow until it is pulverized finely, then drill in the wheat. The crimson clover is either sown in the fall alone; at the first picking of cotton; or at the last cultivation of corn.

EQUIPMENT

As a rule, the farm equipment is good—that is, it consists of good work stock, improved plows, cultivators, harrows, mowing machines, rakes and other labor-saving implements. The farm buildings in many cases are large and well constructed and suitable for housing the grain and hay and sheltering the live stock.

IMPORTATION OF FOOD AND FOODSTUFFS

According to the 1910 census over four million dollars was spent by the people of Mecklenburg County for provisions. Of this amount the farmers themselves spent \$1,800,000. The principal imports in the way of foods and feeds into the country are meat, corn, hay, butter, eggs, chickens, and canned goods. A county like Mecklenburg, which has inherently rich soils capable of being built up to a high state of productivity and which is favored with an excellent climate, should grow all of the home supplies and an excess sufficient to meet much of the demands of the city of Charlotte. Instead of importing products, this county should be ranked among the export counties of the State. Large quantities of butter are shipped into Charlotte daily. This product could be produced easily in the county.

LABOR, SIZE, AND TENURE OF FARMS

Most of the labor by the day and by the month is supplied by the colored race. In some parts of the county from \$20 to \$25 per month is paid for farm help, while day laborers during the busy season usually receive from \$1 to \$1.25 per day. Fifty cents per 100 pounds is paid for the picking of cotton at the beginning of the season, but towards the close from 60 cents to \$1 per hundred is demanded.

A large percentage of the farms in Mecklenburg County are operated directly by the owners, particularly in the Blackjack section. Some of the land is leased for a cash rent, and some for a part of the crop, which is usually one-third to one-fourth of the cotton and grain crops. The share system is in use to some extent, and under this method the landowner furnishes the land, work stock, feed for stock, implements, and one-half of the fertilizer, and receives one-half of all the crops produced. The land usually grows less productive under the renting system.

A few farms range in size from 300 to 600 acres, but the greater number of farms in the county contain from 50 to 200 acres, and often there are many smaller holdings of 20 to 40 acres. The average size farm for the county is about 72 acres.

Land values in Mecklenburg County are greatly influenced by the city of Charlotte, its ready market for produce, and its system of macadamized roads. The good roads have facilitated the marketing of farm products and have advanced materially the value of rural property.

Farm lands in the vicinity of Charlotte are held at \$150 to \$500 an acre; within 6 to 10 miles of the city the value ranges from \$50 to \$100; and the rougher areas and those more remote from railroads and markets bring \$20 to \$50 an acre.

GEOLOGY AND ORIGIN OF SOILS

Mecklenburg County lies wholly within the piedmont plateau region, which extends from the Hudson River to east-central Alabama, attaining its greatest width in North Carolina. The important geological formations are the granites, gneisses, schists, diorites, mica diorites, and gabbros. These rocks vary in their chemical and physical composition. The disintegration and weathering of these give soils of different color, structure, texture and varying in the elements of plant food. The soils contain some of the same minerals as are found in the original rocks from which the soils are derived. All of the upland soils are residual in origin—that is, derived in places from the decay of the underlying rocks.

Extending across the north-central part of the county from the Catawba River west of Spurrier to the Cabarrus line, light-colored coarse-grained granite occurs. These are composed of orthoclase, feldspar, quartz, and some mica, and in weathering form the Durham sandy loam and part of the Cecil coarse sandy loam.

In the southern end of the county, in Steel Creek, Pineville and Providence townships, and on the northeast side between the County Home and the Cabarrus County line and on the western border near Mount Holly Ferry, the diorites, mica diorites, and gabbros are encountered. These are dark green to slick black in color, massive rocks, and composed of plagioclase, feldspar, hornblende, mica, apatite, and magnetite. These rocks are seen on the surface in a few places, and generally the rotten rock is reached at from 20 to 36 inches below the surface. The Mecklenburg and Iredell soils have been derived from these rocks. The Mecklenburg soils differ from the Iredell in having a redder color and the oxidation of the minerals has proceeded further. In many places a dark red soil is the result of better drainage and more thorough oxidation.

Bordering the Union County line and extending in a narrow strip for 4 miles to the Cabarrus County line an area of slate rock is found, which extends across several counties to the east and north. The weathering of this slate gives a smooth floury soil classed as Alamance silt loam.

By far the greater part of the county is underlain by medium textured granites, gneisses, and to a less extent by schists. The granites are noticeable in the southwest corner of the county, east of Davidson, and through the central part around Charlotte. These rocks give rise to the Cecil soils, and in many places the texture of the various soils is due to surface erosion and to the carrying away of the fine material by



FIG. 5. Typical farm scene.



FIG. 6. Roads of this type have been constructed throughout the county.

rain waters. The streams have made inroads into practically all of the uplands, thus modifying the surface features and changing the texture of the soils.

The level areas along the rivers, creeks, and branches mapped as Congaree fine sandy loam and Meadow are of alluvial origin—that is, have been formed and are at present being modified by materials washed down and deposited by the streams.

The soils of Mecklenburg County, owing to the great variety of rocks and the extent of surface erosion, are complicated. In many cases they grade imperceptibly into one another, and some of the types are so closely related that they could be separated only by boundaries more or less arbitrarily placed.

The following table gives the name and extent of each of the soil types mapped in Mecklenburg County:

AREA OF DIFFERENT TYPES OF SOIL.

Soil	Acres	Per Cent	Soil	Acres	Per Cent
Cecil clay loam.....	131,136	37.7	Durham sandy loam.....	7,616	2.2
Cecil sandy loam.....	67,648	19.5	Cecil coarse sandy loam	6,976	2.0
Cecil clay.....	39,168	11.3	Mecklenburg loam.....	5,824	1.7
Cecil fine sandy loam.....	22,272	6.4	Congaree fine sandy loam	3,200	.9
Iredell fine sandy loam.....	17,472	5.0	Alamance silt loam.....	1,280	.4
Meadow.....	16,320	4.7			
Iredell loam.....	14,592	4.2	Total.....	347,520	-----
Mecklenburg clay loam	14,016	4.0			

CECIL CLAY LOAM

The Cecil clay loam soil, locally known as “red land,” occupies almost two-fifths, or 131,136 acres, being by far the largest type in extent in the county. It is an intermediate type, varying in texture and color between the red clay and the sandy loam. The surface soil consists of a brown, reddish brown, to red loam or clay loam, having a depth of 4 to 8 inches. The subsoil is a red stiff clay extending to a depth usually of several feet, being tough and hard when dry, but sticky when wet. Patches of dark brown or snuff-colored loam, locally called “dead land” or “push land,” are common, and frequently spots of Cecil clay are developed, especially on its slopes where surface washing has been active. This type includes patches of sandy loam and fine sandy loam and a few areas with a shallow covering of an inch or two of sandy material.

The Cecil clay loam is the most important and by far the most extensive soil type in Mecklenburg County. It is well represented in about all parts of the county, but is more predominant through the central, eastern, and northern parts where large irregular shaped and continuous areas are encountered.

The characteristic surface features of the type vary greatly, consisting mainly of practically level and gently rolling to rolling areas, though

in some places they become hilly and broken. There are many level and gently rolling interstream areas which lie well for farming operations, but which become rough, hilly, and broken as the streams are approached. The many small streams having their source in this type have cut deeply into the clay subsoil, and thus affected the topography. The surface is sufficiently rolling to insure the best natural drainage, except in a few slight depressions, and even these can be easily drained by ditches or tile drainage. Terracing is practiced on the slopes to prevent washing and gullyng.

The Cecil clay loam has been formed from the disintegration and decomposition of granites, gneisses, and schists. These rocks are composed largely of feldspar, quartz, mica, and hornblende. The feldspar forms the clay, the quartz is left as sand, the mica as small scales, while the iron compounds have oxidized, giving the red color to the soil and subsoil. The narrow quartz veins occasionally found in the subsoil and the quartz fragments on the surface being harder have withstood the forces of weathering. Perhaps 70 per cent of this type is cleared and under cultivation and only patches of the original growth of white, post, red, and chestnut oak, hickory, heart pine, some poplar, dogwood, sourwood, and cedar remain. Old field pine is commonly seen on abandoned fields, which have reforested naturally.

The Cecil clay loam is particularly adapted to the production of corn, cotton, wheat, oats, clover, cowpeas, and dairy farming near Charlotte; and the more sandy areas of the type to strawberries, potatoes, cabbage, tomatoes, and truck crops, and also small fruit and tree fruit. Cotton and corn are the two important crops, the corn being grown as a subsistence crop for work stock and cotton being produced as a money crop. Cotton yields from one-third to one bale per acre; corn from 15 to 35 bushels. As much as 60 to 75 bushels has been secured by deep plowing, good cultivation, the growing of cowpeas, and a liberal application of fertilizer. Wheat yields from 10 to 20 bushels, oats from 20 to 50 bushels, and cowpeas from 1 to 2 tons of hay or from 12 to 25 bushels of shelled peas per acre. Irish potatoes, sweet potatoes, cabbage, tomatoes, sweet corn, turnips, beans, strawberries, and garden vegetables are grown successfully both for market and for home use. Red clover, crimson clover, vetch, and soy-beans are grown to a limited extent. Some sorghum sirup is produced, and also small quantities of apples, peaches, pears, cherries, and figs.

The Cecil clay loam should be plowed a little deeper each year until a depth of 10 or 12 inches is secured. Plowing should preferably be done in the fall, and with subsoiling occasionally practiced to break up the compact subsoil. The type requires more harrowing than the lighter types to give a fine seed-bed, and cultivation must be frequent in order to prevent the formation of a crust and consequent loss of moisture. By following these practices a deeper zone for root development is secured, more plant food is made available, and a better supply of moisture maintained during dry seasons. Better internal drainage also will be estab-

lished and will be an advantage in wet years. Moreover, deeper plowing in the fall and the use of winter cover crops will prevent washing on many of the slopes and largely eliminate the terracing now found necessary.

The Cecil clay loam, owing to the higher percentage of sand, is more friable, works up into a better tilth, and is more easily handled with light implements, or even machinery, than the Cecil clay.

The cowpea vines, clover, or even the stubble of these crops or coarse manures, would greatly benefit the soil. The type is susceptible of high and lasting improvement, and by proper management its yields per acre can, in many cases, be doubled or trebled. Rotation is an important factor in such improvement. A practicable succession under existing conditions, is corn the first year, sowing cowpeas at last cultivation; then oats or wheat, sowing cowpeas again after harvesting; cotton third year, sowing crimson clover after first picking of cotton. When the dairy farming is extended around Charlotte more grasses, clovers, and ensilage crops will be grown in the rotations.

This soil, as a rule, in order to give maximum yields, needs relatively large applications of acid phosphate and considerable nitrogen. The last can be advantageously secured by growing leguminous crops, with only the phosphate and potash being purchased. The commercial mixtures used generally have the formula 8-2-2 or 8-3-3, of which the usual applications for cotton and corn range from 200 to 400 pounds per acre. The home mixture is also used by some on their soils and nitrate of soda is applied to growing crops in the spring.

Land of the Cecil clay loam type varies greatly in price. Location with respect to Charlotte and other markets is the chief factor determining values. Near the towns and along the railroads farms of this type are worth from \$35 to \$75 an acre. In the vicinity of Charlotte prices are higher, ranging from \$75 to \$300 an acre.

The following table gives the average results of analyses of the soil and subsoil of the Cecil clay loam:

AVERAGE CHEMICAL ANALYSIS OF CECIL CLAY LOAM*.

Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.				
	Nitrogen (N)	Phos- phoric Acid (P₂O₅)	Potash (K₂O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P₂O₅)	Potash (K₂O)	Lime (CaO)
Surface } 2mm. {	.053	.051	.439	.27	1035	996	8569	5270
Subsoil }	.021	.0856	.342	.195	1680	6848	27360	15600

*The average chemical analyses herein reported are obtained from individual analyses of many samples of each soil type. The average figures are trustworthy within certain limits. The probable error for the methods used in determining the given constituents seem to be as follows: Nitrogen \pm , .015%; P₂O₅ \pm , .015%; K₂O \pm , .05%; and CaO \pm , .05%.

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.6	7.7	11.4	22.6	9.1	27.3	20.4
Subsoil.....	.2	2.4	3.2	8.9	2.8	40.3	41.8

CECIL SANDY LOAM

This soil, locally called "gray land," covers 67,648 acres, or about one-fifth of the county, being second in extent to the Cecil clay loam. The surface soil consists of a light gray, yellowish gray to light brown medium sandy loam, ranging in depth from 6 to 15 inches. The subsoil is a red stiff clay usually extending to a depth of several feet. In local spots the surface soil is deeper, lighter in texture, and of more open and porous character; especially is this true of a part of the type around Juneau and south of Newell. Included with the sandy loam are spots of clay loam and fine sandy loam of insufficient size to be represented on soil map. Many of them are due to surface washing. A few quartz fragments and occasionally granitic boulders are seen on the surface, while a few small mica scales occur in both the soil and subsoil.

The Cecil sandy loam type is well distributed over the county in many large irregularly shaped bodies. Some of the more prominent areas are located in the southwest corner of the county on the Catawba River, along the South Carolina line, to the southwest of Cornelius, about $1\frac{1}{2}$ miles south of Huntersville, east of Newell, and in the neighborhood of Hickory Grove Church. Other bodies occur in Charlotte Township, around Juneau, Sharon Church, Providence, and in the southern extremity of the county in the vicinity of Kell School and Harrison Church.

The type comprises level and gently rolling to rolling areas, becoming more rolling and broken as the streams are approached. Many of the broad interstream areas occur along the railroads and public roads, and such areas have a very favorable topography for general farming. In the southwest corner, along Catawba River, and in other places where the type has been penetrated by streams, the surface is usually rolling, broken, and somewhat rough. The open texture of the soil, coupled with its rolling topography, insures for it excellent surface drainage. Eroded and gullied areas are seen in places, and on some of the slopes and hill-sides terracing is practiced to control erosion.

The Cecil sandy loam is a residual soil and owes its origin to the weathering of granites, gneisses, and schists. Usually these rocks have disintegrated to a considerable depth, but on some of the slopes soil erosion has kept close pace with decomposition and the accumulation of the subsoil has not been deep, the rock even outcropping in places on

eroded hillsides. The several rock formations are composed largely of feldspar and quartz, with some mica and hornblende. In some places on the slopes and knolls the finer material has been carried away in suspension by rainwater, leaving a looser and deeper layer of sandy material.

A large percentage of this type has been cleared and is now under cultivation, though a few bodies of merchantable timber exist. The forest growth consists of white, red, and post oak, hickory, considerable heart pine, and loblolly pine, together with a little poplar, sourwood, dogwood, sweet gum, and cedar. The second growth is mainly old field pine, interspersed with sweet gum, oak, and cedar.

The Cecil sandy loam in all its phases and variations is a mellow and easily tilled soil, one which warms up early in the spring and which invites the use of labor-saving machinery. It may be rightly termed the main trucking soil of the piedmont plateau in North Carolina. It could be used more extensively near Charlotte for the production of market garden crops for the city market. This would be a profitable business. The more sandy areas are peculiarly suited to the production of early truck crops, and also sweet potatoes, Irish potatoes, peanuts, berries, melons, fruits, and tobacco, while the shallower and heavier areas are well adapted to the growing of cotton, corn, oats, cowpeas, and crimson clover.

Practically all crops common to the county are grown to a greater or less extent. Cotton, however, is the principal crop. The yields range from one-third to one bale per acre, averaging about two-thirds of a bale with good cultivation and liberal fertilization. The big-boll varieties do well on this type. Corn is the second crop in importance and its growth is well distributed over the type, and yields from 12 to 20 bushels per acre ordinarily, but by deeper plowing, more thorough cultivation, and liberal fertilization or manuring, 40 to 60 bushels per acre may be easily produced. Considerable areas of oats are sown, but only a little wheat. Rye does well. Cowpeas are extensively grown, mainly for hay, and from $\frac{3}{4}$ ton to $1\frac{1}{2}$ tons are secured per acre. Some peas are produced for seed. Sweet potatoes yield from 100 to 300 bushels per acre. Frequent patches and occasional small fields are devoted to peanuts. Sorghum is grown to a limited extent for making sirup for home use. The yield is not quite as large as on the heavier soils, but the quality is fine. Watermelons make a strong growth, some of the melons weighing as much as 80 pounds. Irish potatoes, cabbage, beans, cantaloupes, and truck crops, such as tomatoes, lettuce, onions, strawberries, turnips, radishes, and other garden vegetables, give good returns. Peaches, pears, cherries, apples, and figs are commonly seen around the homes. A few patches of alfalfa have been sown, and when inoculated, well manured, and limed, and the soil finely pulverized to a depth of 8 to 12 inches, good returns may be expected. Crimson clover is grown to some extent and more should be sown.



FIG. 7. Quarry from which rock is obtained for constructing concrete roads in the county.



FIG. 8. Prepared to store part of his crop for feeding purposes.

The large yields of corn and cotton secured by the best farmers indicate what this soil is capable of producing when properly prepared, manured, and fertilized. The type can be easily improved, and the improvement made is quite lasting on account of the retentiveness of the red clay subsoil. One of the essential needs of this soil is a larger quantity of humus, and this can be supplied by growing cowpeas, crimson clover, vetch or soy-beans and by applying stable manure. It would be well, especially on the areas where the clay comes near the surface, to plow the land deeper, to secure a finer seed-bed, to subsoil occasionally, and to give the crops better cultivation generally. A systematic rotation of crops, so as to include cowpeas and other legumes, would also aid in building up this soil to a state of high productiveness.

The use of commercial fertilizers is more or less general. Mixtures analyzing 8-2-2 or 8-3-3 are mainly used. Some farmers practice home mixing of fertilizers, using cotton-seed meal, acid phosphate, and potash. Applications of nitrate of soda are also made during the growing season for cotton and corn. About 75 pounds per acre sown along the rows early in July has been found profitable. Nitrate of soda is also applied with good results to wheat and oats in the spring.

Land of this type varies greatly in price in different sections of the county. In the southwest corner the best improved land brings about \$40 an acre, the roughest from \$15 to \$25, while near Charlotte good areas of the type may be had from \$60 to \$100 an acre.

The following table gives the average results of analyses of the soil and subsoil of the Cecil sandy loam:

AVERAGE CHEMICAL ANALYSIS OF CECIL SANDY LOAM.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.027	.018	1.40	.081	550	370	28100	1620
Subsoil }	.023	.020	2.85	.121	1840	1600	228000	9640

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	5.0	19.4	19.3	23.9	6.9	19.7	5.7
Subsoil.....	3.3	9.2	6.5	8.6	2.3	25.6	44.5

CECIL CLAY

The Cecil clay, locally known as "heavy red clay land," comprising 39,168 acres, consists of a red or reddish clay loam or clay underlain to a depth of several feet by a red stiff clay. The soil is hard and crumbly when dry and plastic when wet. There are included with this type a few spots of dark reddish brown clay loam called "sassafras land" or "dead land," the last term referring to the difficulty which is experienced in making it turn or slide off of the plow wing.

This Cecil clay occurs indiscriminately throughout the county. Its greatest development is in Steele Creek and Charlotte townships, to the east of Croft, just west of Huntersville, and along the Catawba River. Other bodies are situated east of Davidson, near Wilson Grove Church, Arlington, Amity and Doren's churches, while many smaller bodies and patches are associated with the Cecil clay loam.

The surface features of this type vary from level and gently rolling areas to hilly and broken areas near streams. The steep hillsides in many places near the Catawba River, particularly in the southwest part of the county, have been cut in deep ravines and gullies. The surface drainage is excellent, but the heavy clay does not allow the free and rapid movement of water downward. This is one reason for the severe erosion on this soil, as much of the rainfall runs off the surface.

Much of the hardwood growth, consisting of white, red, and post oak and hickory was fine merchantable timber and the greater part has been cut. Most of the present second growth is usually old field pine, cedar pine (*pinus Virginianus*), sassafras bushes, and sweet gum. About one-half of the Cecil clay is under cultivation.

The Cecil clay is inherently a strong soil, being one of the best soils in the piedmont section of North Carolina for wheat, oats, and clover, and also a fine soil for corn and cowpeas and other leguminous crops. It is a grass and dairy farming soil. Large yields of wheat were secured prior to the Civil War, and even now on this same soil in near-by counties from 20 to 44 bushels per acre are produced. The leading crops at present are corn and cotton. The yields of corn range from 15 to 60 bushels and of cotton from one-third to one bale per acre. Wheat is grown to a very limited extent. It yields from 15 to 30 bushels per acre. From 20 to 60 bushels per acre of oats may be secured. In Rowan County, North Carolina, as many as 115 bushels per acre have been obtained on this soil. Cowpeas do well, yielding from 1 ton to 1½ tons of hay per acre. In addition to the general farm crops a few cabbage, Irish potatoes, vegetables, sorghum cane, apples, pears, cherries, figs, and peaches are grown. A number of grasses, such as orchard, Bermuda, and crab grass, do well.

Cotton is usually fertilized with 200 or 300 pounds of 8-2-2 or 8-3-3 fertilizers, or with a home mixture of acid phosphate, cotton-seed meal, and kainit. Some barnyard manure is applied to the crops, particularly in dairy districts.

The producing power of the Cecil clay is practically never realized under existing methods of handling it. Deeper plowing, more thorough preparation of the seed-bed, the addition of humus, are essential for increasing the productivity of this soil. The Cecil clay requires heavy teams and strong equipment in the way of farming machinery for the highest efficiency in crop production.

The following table gives the average results of analyses of the soil and subsoil of this type:

AVERAGE CHEMICAL ANALYSIS OF CECIL CLAY.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.071	.053	.39	.233	1409	1052	7740	4624
Subsoil }	.029	.0361	.3503	.153	2307	2872	27873	12174

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.2	3.9	4.7	11.3	7.8	20.6	50.3
Subsoil.....	1.6	2.3	2.8	6.3	6.3	20.8	59.9

CECIL FINE SANDY LOAM

There are 22,272 acres of this soil in the county. It is a mellow fine sandy loam of a yellowish gray to light brown color and has a depth of 6 to 12 inches. It is underlain by a red, stiff clay, extending to a depth of 3 feet or more. Between Matthews and Mint Hill and around Hoods the soil is a light brown, very fine sandy to silty loam.

This type of soil is largely confined to the southeastern and north-eastern parts of the county. It is well developed around Matthews, near Hoods, along the Union County line, to the southeast of Amity Church in the vicinity of Thompson Store, on Pine Ridge, around Paw Creek and near Sharon Church.

Its surface varies from gently rolling to hilly and broken, the smoother surface areas lying between Matthews and Mint Hill and the more broken areas, ridges and knolls, occurring near the Cabarrus County line and south of McAlpine Creek. Natural surface drainage is good, and even excessive on the steeper slopes, resulting in serious erosion in many

places. The soil has been derived from the fine-grained granites, gneisses, and schists; the original bed rock in places comes near the surface.

The Cecil fine sandy loam is a mellow and easily tilled soil when properly plowed and pulverized, and only in the heavier and more clayey spots is there any baking or clodding. The forest growth consists of oak and pine, with some hickory, sourwood, dogwood, and cedar. Perhaps more than one-half of it is under cultivation. It is well suited to cotton, corn, melons, strawberries, potatoes, cabbage, and the heavier areas to wheat, oats, and cowpeas. Cotton yields from one-third to one bale per acre, depending upon the amount of fertilizer applied and the treatment of the soil. Corn, as a rule, gives low yields, but good crops can be easily secured. Sweet potatoes, oats, cabbage, crimson clover, and cowpeas do well. Strawberries grown on this soil yield heavily and have good size, flavor, and shipping qualities. Lady Thompson, Bubach, and Crimson Cluster seem to be the favorite varieties. They ripen the last of April and first of May. Considerable quantities of vegetables, including Irish potatoes, are produced. Fruit and sorghum for sirup constitute other secondary products of the type.

On the heavier areas of this soil the small grains, grasses, clovers, and corn can be made to give much larger yields by handling the soil differently. For increasing the productivity of this soil, the same treatment can be followed as outlined under the Cecil sandy loam. From 200 to 400 pounds of an 8-3-3 fertilizer is used by the majority of farmers; some, however, mix cottonseed meal, acid phosphate, and kainit, applying this in quantities varying from 150 to 200 pounds per acre. Cowpeas and slover and also barnyard manure improve the soil and always give increased yields in the succeeding crops. This land sells for \$20 to \$60 an acre.

The following table gives the results of analyses of the soil and subsoil of the Cecil fine sandy loam:

AVERAGE CHEMICAL ANALYSIS OF CECIL FINE SANDY LOAM.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm {	.035	.017	.788	.155	686	334	15459	3039
Subsoil }	.017	.069	.679	.172	1320	5480	54320	13760

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	0.8	5.1	10.0	30.8	28.3	19.9	5.1
Subsoil.....	0.6	2.1	2.3	7.5	6.3	27.3	53.7

CECIL COARSE SANDY LOAM

This is the smallest type in extent of the Cecil soils, occupying as it does only 6,976 acres. It differs from the Cecil sandy loam in that it has more coarse sand and fine gravel in the surface portion, thus producing a more open and porous soil. The subsoil is a red clay, carrying a noticeable amount of coarse sand particles.

The Cecil coarse sandy loam is scattered over the county, but the largest bodies are found northeast of Ramah Church, on the Cabarrus County line, north of Robinson's Store, northeast of Providence, and around Sardis. Its surface features vary from level, gently rolling to rolling, and broken. The open texture of the soil and the rolling surface promote excellent drainage in all areas. In origin, this soil has been formed by the decomposition of coarse-grained granites composed of feldspar, quartz, and mica.

Most of the soil has been cleared and is now under cultivation. It is easily tilled, warms up quickly in the spring, and responds readily to good treatment. It is suited to practically the same crops as the Cecil sandy loam. Cotton produces one-third to one bale per acre and corn 10 to 30 bushels. Cowpeas do well and rye gives good returns. Of oats, only small yields are secured. Sweet potatoes and early truck crops give good results and can be grown to advantage near the markets.

This soil, like its associated types, needs more humus. The hillside fields should be planted in a winter cover crop; the more broken areas should be reforested or used as pasture.

For further suggestions of methods to be used in handling this soil, see description of Cecil sandy loam. The same fertilizers are applied to this type as used on the other sandy loams of the series.

The Cecil coarse sandy loam is held at \$15 to \$50 an acre.



FIG. 9. Preparing the land for cotton with a cutaway harrow drawn by a traction engine.



FIG. 10. Cotton being grown on Cecil clay loam soil in Mecklenburg County.

The following table gives the results of analyses of the soil and subsoil of the Cecil coarse sandy loam:

AVERAGE CHEMICAL ANALYSIS OF CECIL COARSE SANDY LOAM.

		Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
		Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	} 2mm. {	.031	.033	.373	1.45	523	556	6289	24447
Subsoil		.024	.065	.245	.23	1847	5002	18556	17700

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil-----	19.4	14.5	7.4	13.5	10.4	24.8	10.0
Subsoil-----	5.0	6.6	3.3	7.4	3.0	28.7	45.7

IREDELL FINE SANDY LOAM

The Iredell fine sandy loam, or "blackjack land," consists of 5 to 10 inches of a gray or brown fine sandy loam. This is underlain by a yellow, or brownish yellow, impervious sticky clay called "pipe clay," or "beeswax land." This is extremely sticky when moist and cracks open upon drying. It seldom extends below 24 or 30 inches, grading at these depths into the rotten rock. A few small rounded iron concretions are usually present in the soil.

This type comprises 17,472 acres, lying mainly in the northwestern and western parts of the county along Mallard Creek and south of Long Creek Church. Its surface features vary from level to rolling, most of it being rolling and composed of ridges, knolls, and slopes. In some sections the topography is rough and broken, especially in places along the Cabarrus County line. The natural surface drainage is good, except for a few flat areas, and here open ditches are necessary.

The Iredell fine sandy loam has been derived from diorite rock, with some granite. The forest growth is mainly blackjack oak, although some post and willow oak and considerable cedar are seen in places. In abandoned areas old field pine has taken possession of the land.

The soil is best suited to small grains and grasses and should be used for pasturage purposes. The areas occupying the more favorable topography are fairly well suited for the production of cotton and corn. Cot-

ton yields from one-third to one bale, corn from 12 to 30 bushels, oats from 20 to 50 bushels, and wheat from 10 to 15 bushels per acre. Cow-peas do well. Potatoes, cabbage, and other vegetables and some fruits do fairly well. Sorghum also gives fair yields. The cotton, corn, and small grain are all fertilized, and the larger yields have been secured when liberal applications were given. Kainit is beneficial and is being used more generally. The soil needs more humus and lime. Stable manure should be applied wherever available.

Some rust of cotton is reported, but it is not nearly as prevalent as on the Iredell loam. Omitting deeper plowing on the deeper and more sandy areas, this soil requires practically the same treatment and fertilization as the Iredell loam.

Land composed of Iredell fine sandy loam sells at \$20 to \$40 an acre.

The following table gives the average results of analyses of the soil and subsoil of the Iredell fine sandy loam:

AVERAGE CHEMICAL ANALYSIS OF IREDELL FINE SANDY LOAM.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.042	.041	.270	1.92	783	764	5093	36278
Subsoil }	.027	.034	.232	2.69	2160	2680	18560	215360

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	5.1	8.8	8.7	23.7	21.0	20.0	12.6
Subsoil.....	.6	1.7	1.7	6.1	14.3	32.2	43.6

IREDELL LOAM

The Iredell loam, or typical "blackjack land," comprising an area of 14,592 acres, is a dark gray or dull or rusty brown loam or heavy, fine sandy loam, having a depth of 4 to 8 inches. The subsoil is a brownish yellow, impervious, waxy, sticky, clay extending to a depth of 20 to 36 inches where it passes into soft, disintegrated dark-green rock. This clay, on exposure to weathering, turns a dull rusty brown color, as seen in road cuts; cracks open upon drying, and when wet has the consistency of putty. The soil contains from 5 to 25 per cent of small, rounded

iron concretions, but these do not interfere with cultivation. In the low wooded areas the surface soil in places is almost black.

The greatest development of this type is in the southern part of the county to the east of Pineville, north of Downs Church, around and to the north of Kendrick Crossroads, and south of Shopton. Large bodies also occur west of Hopewell Church, east of Long Creek Church, and east of Jonas Church.

This soil is characterized by flat, undulating, and gently rolling surface features, though spots occur on knolls and ridges. The more rolling areas possess good surface drainage, but the drainage of the flatter areas is poor, and open ditches are essential in preparing the land for cropping. Some little trouble is experienced in the spring and during heavy rains in the summer in getting these areas dry. This, however, can be overcome to some extent by ditching and deeper plowing. The impervious clay subsoil prevents drainage and naturally causes the lower lying areas to be of a rather cold nature.

The Iredell loam, like the fine sandy loam, has been derived from diorite. Some of the "nigger-head" rocks are seen on the surface in places.

Blackjack oak is the predominating forest growth, although some post oak and willow is found. On ridges and slopes cedar and old field pine are characteristic trees.

Until recently the Iredell loam has been looked upon as a poor soil for general farming, but now it is highly prized. In Mecklenburg County it is well adapted to cotton, corn, oats, wheat, and the grasses. Cotton yields from one-third to one bale, corn from 20 to 40 bushels, oats from 20 to 60 bushels, and wheat from 10 to 30 bushels per acre. Cowpeas, vetch, Johnson grass, and lespedeza do well. The grasses make an excellent growth and afford good pasturage for cattle or sheep, and stock raising could be profitably extended. Fruits do not produce as well on this soil as on the Cecil types. Cabbage, sorghum, potatoes, and garden vegetables are grown for home use.

One of the best and most economical ways to improve the Iredell loam is to plow deeper, turning the soil in the fall, and occasionally subsoiling, leaving the land rough and exposing a thin layer of the sticky clay subsoil to the weather. Alternate freezing and thawing during the winter will cause the materials to crumble, and by spring a much better physical condition will have been produced. This method promotes better drainage and, besides, affords a deeper seed-bed for the plants and will tend to prevent the rusting and "frenching" of the crops. At present these diseases affect the crops on practically all areas of the type. The rust of cotton usually shows from the first to the middle of July, and the diseased plants never fully open their bolls, making picking difficult.

A good rotation for the Iredell loam would be corn, sowing cowpeas at last plowing, followed by winter oats, and then by cotton. It is said

that cotton is especially subject to "rust" when grown immediately after cowpeas have occupied the land. The same brands and mixtures of fertilizers are used on this soil as on the other soils of the county. Corn needs a somewhat larger amount of nitrogen. Cotton requires a relatively heavy application of kainit to correct the rust. A top dressing with nitrate of soda applied to corn in the middle of July will give increased yields. The Iredele loam needs manure and lime. Of the former the supply is wholly inadequate, but the latter can be purchased cheaply, and if used alone or in combination with fertilizers will be found profitable.

Areas of this soil south of Shopton and around Potts' Store sell at \$30 to \$50 an acre, while some in other sections can be bought for \$25 an acre.

AVERAGE CHEMICAL ANALYSIS OF IREDELL LOAM.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.053	.267	.438	3.01	997	5025	8243	56648
Subsoil }	.0343	.112	.307	4.02	2722	8888	24364	319027

MECKLENBURG CLAY LOAM

This soil is locally known as "red blackjack land" and covers 14,016 acres of the county. The surface soil consists of 4 to 8 inches of brown to reddish or red heavy loam or clay loam. It is underlain by a yellowish-brown or ochre to red-colored clay of a plastic, sticky nature. However, usually at 24 to 30 inches it grades into a soft, greasy, partially decomposed greenish-yellow rock. A few small iron concretions are of local occurrence. Included in this type are ridges and knolls of a dark red clay loam underlain by a deep red clay of a smooth structure.

The Mecklenburg clay loam is confined to the southern and southwestern parts of the county near the headwaters of Neal and Stowe branches and around Potts' Store. Level to gently rolling surface features are characteristic of the type. Surface drainage is good except in a few of the flatter areas, and here open ditches will serve every purpose. The close, impervious character of the subsoil prevents a free movement of water downward and most of the rainfall runs off, thus eroding the steeper slopes.

This soil is due to the weathering of the underlying rocks, such as mica-diorite and gabbro-diorite, which contain large amounts of magne-

tite (about 13 per cent), apatite, feldspar, hornblende, and mica. These rocks differ from those giving the Cecil soils, and hence the soils derived from them are markedly different.

Most of the Mecklenburg clay loam has been cleared and is under cultivation. Johnson grass is indigenous, growing wild in many places and being cut for hay or pastured. This soil is especially adapted to clovers, vetches, soybeans, and the red areas to alfalfa. It is also a good soil for cotton, wheat, corn, and oats. Cotton yields from one-half to one bale, corn from 20 to 40 bushels, oats from 20 to 40 bushels, and wheat from 12 to 20 bushels per acre. Larger yields of all crops can be easily secured, and in some instances as much as 60 bushels of corn and $1\frac{1}{2}$ bales of cotton have been produced. Johnson grass and Japan clover furnish excellent pasturage, though it is said that continual pasturing of the former will kill it in two or three years. It makes its best development in the cultivated fields. Kainit gives better results than any other fertilizer. It prevents in a large measure the "frenching" of corn and the "rusting" of cotton. Little or no rust occurs over large areas where the subsoil extends to depths of 3 or 4 feet or more. Some complaint is heard that cotton rusts when planted after cowpeas, but those who use kainit liberally have no trouble from this disease.

The Mecklenburg clay loam is naturally a very strong and productive soil and one which can be built up to a high state of productivity by proper farm management. Deep fall plowing, so as to allow the clay to freeze and thaw during the winter, will greatly improve the physical condition of the soils. The growing of legumes and the use of phosphatic fertilizers and lime will be found profitable.

Land of this type of soil where well improved sells for \$35 to \$75 an acre. Where the improvements are nominal, farms may be had for \$25 to \$40 an acre.

The following table gives the average results of mechanical analyses of the soil and subsoil and a single analysis of the lower subsoil of the Mecklenburg clay loam:

AVERAGE CHEMICAL ANALYSIS OF MECKLENBURG CLAY LOAM.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of $6\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P_2O_5)	Potash (K_2O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P_2O_5)	Potash (K_2O)	Lime (CaO)
Surface	} 2mm. {	.073	.125	.659	1460	2500	13180	6390
Subsoil		.058	.095	.474	4640	7600	37920	195920

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.5	3.4	5.9	23.9	18.5	16.8	30.4
Subsoil.....	0.6	2.4	3.6	12.2	10.3	25.3	45.7
Lower subsoil..	0.0	1.2	4.1	20.8	19.9	28.4	25.6

MECKLENBURG LOAM

The surface soil of the Mecklenburg loam, to a depth of 6 to 8 inches, is a loam to heavy sandy loam varying in color from dark brown to reddish brown. The subsoil is yellowish-brown or ochre-colored tenacious clay, which frequently at 24 to 36 inches grades into a friable greasy clay or partially decomposed soft rock. Small rounded iron concretions are present in the soil in many places, and between Henderson Ferry and Hopewell Church and near Long Creek Church rock fragments are scattered on its surface.

This type occurs in small bodies in the southwestern part of the county in the vicinity of Center Church and to the east of Kendrick Crossroads, and also in large bodies west of Hopewell Church, north of Henderson Ferry, east of Allison's Ferry, and east of Huntersville. Its area embraces 5,824 acres of land.

The type commonly occupies level, undulating, and gently rolling areas, but in a few instances the surface is rolling. Practically all the areas have good surface drainage except certain flat areas, in which open ditches are necessary to carry off surplus water. It has been derived from the weathering of the underlying rocks, which are gabbrodiorite and diorite, with considerable mica.

A large proportion of this soil is under cultivation, the remainder being forested to white, red, post, and blackjack oak, considerable hickory and a few cedar and pine. The soil is well suited to corn, cotton, oats, and wheat, and to pasture purposes. Japan clover, Johnson grass, and other grasses are indigenous, and where permitted to grow or encouraged in their growth afford fine grazing for cattle.

The Mecklenburg loam, under favorable conditions and with fertilization, produces from one-half to one bale of cotton per acre, from 15 to 30 bushels of corn, and from 15 to 40 bushels of oats. Cotton matures a few days earlier on this soil than it does on the Mecklenburg clay loam. All of the rolling areas can be used profitably for sheep pasturage. About the same fertilization and methods of treatment of this soil can be applied to this soil as recommended for its associated type, the Mecklenburg clay loam.

This land sells for about the same price as the clay loam, excepting areas in remote sections and those carrying stone.

The following table gives the results of analyses of the soil and subsoil of this type:

AVERAGE CHEMICAL ANALYSIS OF MECKLENBURG LOAM.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.031	.102	.244	1.96	600	1975	4724	37946
Subsoil }	.036	.056	.135	1.59	2880	4480	10800	127200

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	2.3	6.9	7.5	25.2	21.7	19.0	17.3
Subsoil.....	.2	1.8	3.9	13.3	9.5	20.3	51.1

DURHAM SANDY LOAM

The immediate surface soil is a grayish or whitish loamy sand which grades into a pale yellow sandy loam. The subsoil beginning anywhere between 8 and 20 inches is yellow, friable clay, carrying sharp particles of quartz sand. There are 7,616 acres of this soil, which lies in an almost unbroken body extending across the north-central part of the county, beginning near Catawba River, west of Superior, and continuing to the south of Huntersville. Smaller bodies lie southeast of Matthews and south of Newell.

The Durham sandy loam is derived from coarse-grained granites composed mainly of feldspar and quartz and some mica. The surface of the soil is gently rolling on the crest of ridges and hilly to broken on the slopes. Excellent surface drainage prevails everywhere, and on some of the steeper slopes erosion is pronounced. Only patches of the original forest growth of oaks and hickory remain, while the second growth is mainly old field pine, scrub oak, and sweet gum.

The Durham sandy loam is universally recognized as one of the best soils in the piedmont region of North Carolina and Virginia for the production of bright tobacco, although none is grown on a commercial scale in Mecklenburg County. There is every reason to believe that this industry could be profitably extended here as is the case in Davidson, Durham, Caswell, Granville, and other counties. The soil is also well suited



FIG. 11. Growing corn on the Cecil sandy loam soil and producing a good crop of cowpeas in the corn by seeding at the last cultivation of the corn.



FIG. 12. Growing cowpeas in rows on a hillside.

to the production of sweet potatoes, watermelons, cantaloupes, berries, and truck crops. Corn yields from 10 to 20 bushels, cotton from one-fourth to one-half bale, sweet potatoes from 80 to 300 bushels per acre. Rye does well, while cowpeas and sorghum give fair returns. Peaches and cherries find a congenial home in this soil. At present the fertilizer practice on this type is not materially different from that on the Cecil sandy loam.

As the light color would indicate, this soil is markedly deficient in humus. It is a mellow, easily tilled soil, warms up early in the spring, and requires only shallow plowing and cultivation with light implements. By turning under coarse manures and green manuring crops, such as cowpeas, crimson clover, or rye, the humus content could be greatly increased and a more loamy condition produced in this soil which would be reflected in larger yields of staple crops.

Land of the Durham sandy loam sells at \$20 to \$60 per acre.

The following table gives the results of mechanical analyses of the soil and subsoil of this type:

AVERAGE CHEMICAL ANALYSIS OF DURHAM SANDY LOAM.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	.026	.014	.160	.400	489	269	3069	7672
Subsoil								
2mm.	.023	.019	.252	.446	1789	1443	19515	35313

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	4.4	29.2	20.3	18.6	8.1	12.8	6.4
Subsoil.....	1.5	17.9	13.9	12.7	5.6	15.5	32.7

CONGAREE FINE SANDY LOAM

This type, comprising 3,200 acres, is a fine sandy loam of a light brown to reddish brown color and generally extending to a depth of 36 inches or more. Small scales of mica are present in noticeable quantities. Bordering the river are frequently seen narrow bands of fine sand which were included with this type.

Areas of the Congaree fine sandy loam are confined to narrow belts along the Catawba River. They lie from 8 to 15 feet above the normal water level of the stream. At times of high water most of it is overflowed, but good crops are usually secured. This soil, like the Meadow, is of alluvial origin and represents materials washed from the uplands and deposited by the Catawba River. The soil possesses a very mellow structure, is easily tilled, good capillary action is established, and the supply of moisture for the growing crops is adequate. Farm machinery can be used on all areas advantageously.

The Congaree fine sandy loam is suited to the production of corn, watermelons, oats, and rye. Some of the largest watermelons grown in North Carolina are the product of this type with manure and fertilizers. This is an ideal corn soil and large yields can be secured. It is difficult to state its value, as it is sold with the adjoining uplands.

The following table gives the results of analyses of the soil of this type:

AVERAGE CHEMICAL ANALYSIS OF CONGAREE FINE SANDY LOAM.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	.049	.151	2.04	.92	980	3020	40800	18400
Subsoil								
2mm. {	.020	.150	2.10	.81	1600	12000	168000	64800

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.4	8.1	8.9	32.8	19.5	17.5	11.4

ALAMANCE SILT LOAM

This is a yellowish gray to whitish floury silt loam from 4 to 6 inches deep. The subsoil is a yellow silty loam which quickly grades into a yellow silty clay. This is the smallest type in extent in the county, covering only 1,280 acres. It lies along the Union County line just south and east of Clear Creek Church. However, it is but the beginning of an extensive belt of soil which extends across Union, Montgomery, Stanly, Randolph, Cabarrus, and other counties.

This type of soil is derived from the Carolina slates. These rocks are near the surface in many places and outcrops occur and fine fragments of them are locally scattered over the surface.

Low yields of cotton, corn, and oats are obtained. The soil is decidedly deficient in humus, but if this is supplied and the soil is limed and phosphatic fertilizers used good yields can be secured. The type can be brought to a higher state of productiveness as the subsoil holds manures well. The soil is inclined to bake to some extent, but this can be overcome by incorporating organic matter, by deeper plowing, and by more thorough pulverization and frequent shallow cultivation.

The following table gives the results of analyses of the soil and subsoil of this type:

AVERAGE CHEMICAL ANALYSIS OF ALAMANCE SILT LOAM.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.039	.064	.20	.771	717	1176	3676	14171
Subsoil }	.022	.039	.32	.151	1686	2989	24525	11573

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	2.9	5.3	3.8	9.1	4.4	60.8	13.7
Subsoil.....	1.9	2.4	1.5	4.1	4.1	58.4	27.6

MEADOW

The Meadow land in Mecklenburg County is well distributed in narrow strips along most of the creeks and branches, embracing a total of 16,320 acres. It consists of material which has been washed from the uplands, carried down and deposited by the streams at time of overflow. The soil varies in texture from a silt loam to a fine sand, and in color from brown to red. Small scales of mica are characteristic of the material.

The surface of the Meadow is level and flat and lies only a few feet above normal water level of the streams, and it is subject to overflow. Practically all areas could be drained, reclaimed, and made productive by straightening and deepening the natural drainageways or construct-

ing canals. The Meadow area immediately west of Charlotte is an example of this drainage, and it is likely that more of this land will be reclaimed.

With the exception of the more sandy areas the Meadow soil is naturally strong and is especially suited to the production of corn. Large yields (from 30 to 60 bushels) could be obtained without the use of fertilizers. The yields will surpass those upon the famous corn soils of the Middle West.

In its present condition, Meadow is used mainly for pasturage purposes during the summer months.

STORE OF PLANT FOOD IN SOILS OF THE COUNTY

The chemical examinations of the soils of the county have shown, in a general way, that phosphoric acid and nitrogen are the plant-food constituents contained in smallest amounts. This has been the finding with reference to most of the soils occurring throughout the piedmont section of the State. The soils that show the largest content of nitrogen are the Mecklenburg clay loam, Cecil clay, Cecil clay loam, Iredell loam, and Congaree fine sandy loam. Those showing the smallest amount of nitrogen at the present time are Durham sandy loam, Cecil sandy loam, Cecil coarse sandy loam, Mecklenburg loam, and Alamance silt loam.

Phosphoric acid is highest in the Iredell loam, Congaree fine sandy loam, Mecklenburg clay loam, Mecklenburg loam, and Alamance silt loam, and lowest with Durham sandy loam, Cecil fine sandy loam, Cecil sandy loam, Cecil coarse sandy loam, Iredell fine sandy loam, Cecil clay loam, and Cecil clay, in the order given. Iredell loam, Congaree fine sandy loam, Mecklenburg clay loam, and Mecklenburg loam are quite high, relatively speaking, as compared with other piedmont soils of other series in phosphoric acid content, particularly is this so with reference to the Iredell loam and the Congaree fine sandy loam.

In potash content the soils of this county, as of other counties located in the piedmont section of the State, are generally relatively high. Those containing this constituent in the largest amount are Congaree fine sandy loam, Cecil sandy loam, Cecil fine sandy loam, Mecklenburg clay loam, Iredell loam, Cecil clay, and Cecil coarse sandy loam. Those containing this constituent in the smallest total amount are Durham sandy loam, Alamance silt loam, Mecklenburg loam, Iredell fine sandy loam, and Cecil clay loam.

In lime content the Iredell loam is decidedly higher than soils of other types occurring in the county. Other soils having a high content of lime are Mecklenburg loam, Iredell fine sandy loam, and Cecil coarse sandy loam. Those containing the lowest amount of lime are Cecil sandy loam, Cecil fine sandy loam, Cecil clay, Cecil clay loam, Mecklenburg clay loam, Durham sandy loam, Alamance silt loam, and Congaree fine sandy loam, in the order given. The Cecil sandy loam is very low in this constituent.

WHAT EXPERIMENTS HAVE SHOWN TO BE THE CHIEF NEEDS
OF THE SOILS

Experiments which have been conducted in this county on the Cecil clay, in Iredell on Cecil clay loam, and in Gaston on Cecil sandy loam, have shown for several years that nitrogen and phosphoric acid are the constituents chiefly needed. Potash has not generally shown to be essential except for such crops as tobacco and potatoes, which are heavy users of this constituent.

Field tests on the Iredell loam type have shown unmistakably that nitrogen is of the greatest importance for profitable returns to be secured in growing crops on this soil as it occurs on an average in the county. Potash has been found to give moderate returns when applied, but phosphoric acid has not shown to be at all profitable. As a matter of fact the yields have not been increased by the use of acid phosphate which carried phosphoric acid in the experiments.

For cotton and corn, lime has not shown to be of pressing need. Especially is this so where these crops are grown without intervening cover crops in the rotation. The soil is very high in this constituent, as shown by analyses, and it would probably not be as essential to use lime on this soil as on others like the Cecil soils which contain this constituent in much smaller quantities. It is of interest to know that the surface $6\frac{7}{8}$ inches of the Iredell loam type of soil as it occurs in this county contains enough phosphoric acid for about 137 100-bushel corn crops, potash for 381 crops, and only enough nitrogen for less than 11 crops of this size, when the grain is removed and the stalks and leaves are plowed in each year.

It might be that when nitrogen is added in sufficient quantities to the Iredell loam soil to produce maximum crops that applications of phosphoric acid would show an influence upon the yield. Notwithstanding the high potash content, when it is selling at moderate prices, applications in moderate quantities has generally paid. This may be due to an indirect effect rather than as a direct plant food. On this particular type the application of potash-bearing materials like kainit, which contain a high percentage of common salt, beneficial results may be due to the salt contained rather than the potash contained. There is no question but that the use of materials like kainit on soils of this character reduce the amount of cotton rust. Experiments have shown that the use of ordinary refuse meat salt at the rate of 300 to 500 pounds per acre also will greatly lessen this trouble on soils of this character.

Results on the Durham sandy loam type of soil have shown that nitrogen, at the present time, is the chief need. Next in importance is phosphoric acid and potash—potash being the least essential at the present time on the crops like corn, cotton and small grains. When a proper system of rotation of crops is practiced, lime will be found to be essential on soils of this series.

The Mecklenburg clay loam has been shown to be chiefly benefited by applications of nitrogen. Phosphoric acid and potash do not seem to

be essential at the present time. The analysis of this type of soil would indicate practically the same conclusions that have been drawn from field experiments conducted on the same type in Cabarrus County.

Experiments in Union County on the Alamance silt loam type of soil have shown that nitrogen is here of the chief importance. Phosphoric acid appears to be a close second. Potash and lime have shown, on an average, to give some returns, but are not nearly so important as are applications of nitrogen and phosphoric acid. Where legumes are to be grown, lime would be essential in order to secure the best returns. More than three-fourths of the soils of this county belong to the Cecil series, and this series has shown both by analysis and by field results that nitrogen and phosphoric acid are the chief plant-food requirements at the present time.

HOW SUPPLY THE PLANT-FOOD REQUIREMENTS

For Nitrogen.—Soils that show a need for applications of nitrogen can usually be considered as deficient in organic matter. When the organic matter is high it can usually be figured that the soil is relatively high in nitrogen content. Analyses and field results have shown that the soils of the county are generally low in nitrogen. One of the main problems for the farmers is, therefore, to supply this constituent in large quantities and as cheaply as possible. The chief means that must be used in supplying this constituent will be by the growing of suitable leguminous crops on the land and turning all or part of these into the soil. By such a plan not only would the nitrogen be increased, but the physical properties of the soil would be greatly improved by the addition of the organic matter.

Other materials that may be depended upon are commercial fertilizers and farm manures. The commercial materials carrying nitrogen are usually quite expensive. It is frequently difficult to have low-priced products like corn pay well for other than moderate applications of commercial forms of nitrogen. Where cotton is grown and fairly good prices secured for the lint, farmers may use commercial forms of nitrogen with a profit if they are properly combined with other materials to supply the other needs of the crop grown on their particular soils.

Where grains and grasses are grown chiefly other sources than commercial will have to be depended upon. Barnyard manure furnishes one of the most desirable sources of this constituent as it contains large amounts of organic matter with nitrogen and moderate amounts of phosphoric acid and potash. This material, however, is not a well-balanced fertilizer for the soils of the county, and it will therefore have to be supplemented by materials carrying the required fertilizing constituents needed by the soils of the county, the chief of which, as indicated above, is phosphoric acid for the Cecil soils after nitrogen has been provided. As valuable as this manure is, the supply of organic matter and nitrogen cannot be kept up in the soils of the county generally by having to

depend upon the manure produced on the farm as the amount is relatively very small as compared with the acreage devoted to the growing of crops.

For Phosphoric Acid.—This constituent is very low in the soils of the county, except those of the Iredell, Congaree, Alamance, and Mecklenburg series indicated above. With the farmer, it is necessary to good profits for him to use the source of phosphoric acid which will give the highest net returns. Taking everything into consideration, the two commercial forms to be depended upon at the present time are acid phosphate and basic slag. Of course there will be added to the soil a considerable amount of phosphoric acid when manure, cotton-seed meal, soybean meal, or ground bone is used alone or in such materials as tankage and fish scrap are added to the soil. Where large amounts of organic matter are being turned into the soil, in many cases, it will be profitable to add finely ground phosphate rock. The organic matter in rotting will tend to bring into an available form some of the phosphoric acid contained in this material. Again, a good plan in many cases would be to add this material to manure in the stable as it is being formed, using at the rate of one or two pounds per day broadcast over the manure, making the applications about once or twice per week.

For Potash.—Generally, with the soils of this county as well as with other Piedmont soils, the least important of the main plant-food constituents has been found to be potash. Durham sandy loam has been found to be lower in this constituent than any other type of soil found in the county. The soils of the county contain enough potash in them for the growth of maximum crops for a long time to come, but it is present largely in a quite insoluble form. It is, therefore, with the soils of this county more of a problem of making the supply available than of increasing its content by the addition of materials supplying this constituent. Not only do the chemical analyses show a liberal supply of potash, but in all cases experiments show that it is far less essential than nitrogen and phosphoric acid, except in the case of the high phosphoric acid soils. When the price of potash is as high as it is now its use will not usually pay with the ordinary crops of this section, such as cotton, corn, and small grains.

For Lime.—When the main crops of the county, like corn, cotton, and the small grains, are grown continuously on the land without the turning in of leguminous crops, lime will not usually be found of primary necessity. However, when cover crops are used, as they should be, on all the soils, especially on soils low in organic matter, lime will usually be found to be essential. Even with those soils high in lime, like the Iredell loam, Iredell fine sandy loam and Cecil coarse sandy loam, it will no doubt be beneficial to make applications of this material as the lime in these soils is in the form of silicates, which do not act in the same beneficial way as does calcium carbonate as found in ground limestone, shells, and marl.

FERTILIZER MIXTURES TO USE FOR DIFFERENT CROPS

For the average soils occurring in the county, with the exception of Iredell loam, Congaree fine sandy loam, Mecklenburg clay loam, and Mecklenburg loam, it is recommended for cotton, the use of 400 to 600 pounds of a mixture containing 10 to 12 per cent available phosphoric acid and $2\frac{1}{2}$ to 4 per cent of ammonia. When the price of actual potash is not greater than 5 to 6 cents per pound it has been found profitable to use at least 2 per cent in the mixture. However, when the price of potash is as high as at present, it will not generally be found to pay. A mixture that will give approximately this proportion is the following:

Acid phosphate, 16 per cent.....	400 pounds
Cotton-seed meal, $7\frac{1}{2}$ per cent.....	200 pounds
	—
Total.....	600 pounds

Other mixtures may be used in which dried blood, fish scrap, sulphate of ammonia, or nitrate of soda may be substituted for the cotton-seed meal. In making the substitution it may be done by using 47 pounds of blood, 75 pounds of fish scrap, 30 pounds of sulphate of ammonia, or 42 pounds of nitrate of soda for each 100 pounds of cotton-seed meal in the mixture. If desired, especially on the sandier soils of the county, one-third to one-half of the nitrogen may be put in at the time the cotton crop is planted, reserving the other half to two-thirds to be added as a side dressing in the form of sulphate of ammonia or nitrate of soda about the first of July.

For corn, small grains, grasses, sorghum, grown on average soils in the county, except of the high phosphoric acid types indicated above, from 250 to 400 pounds of a mixture containing 10 to 12 per cent available phosphoric acid and 5 to 6 per cent of ammonia will give good returns. Potash up to $1\frac{1}{2}$ to 2 per cent in the mixture has been found to pay when this constituent is selling at normal prices. A mixture that will give approximately the right quantities of nitrogen and phosphoric acid is as follows:

Acid phosphate, 16 per cent.....	200 pounds
Cotton-seed meal, $7\frac{1}{2}$ per cent.....	200 pounds
	—
Total.....	400 pounds

Here, as above, the other recognized suitable carriers of nitrogen may be substituted for the cotton-seed meal in the proportions indicated.

For clovers, cowpeas, soybeans, and other leguminous crops, 300 pounds of 16 per cent acid phosphate will usually be found satisfactory on soils containing a moderate amount of organic matter. In many cases this quantity may be increased to 500 pounds to good advantage. Potash-supplying materials are not usually necessary on these soils. In

case the land is very poor, so that the young plants do not start off well, a sufficient amount of cotton-seed meal, dried blood, or other nitrogen-furnishing material, may be added which will supply nitrogen to give 1 to 2 per cent in the mixture. When 300 to 500 pounds of 16 per cent acid phosphate is used 50 to 75 pounds of cotton-seed meal, or its equivalent in nitrogen content of blood or other nitrogen carrier, may usually be used to good advantage. If nitrogen is needed later, as is indicated by small, slow growth, and pale, sickly appearance of the plants, a top dressing of 50 to 75 pounds of nitrate of soda per acre may be applied with profit.

When potash is as high in price as it is at this time, the most profitable application for Iredell loam (blackjack), Congaree fine sandy loam, Mecklenburg clay loam, and Mecklenburg loam will be for cotton 300 to 500 pounds of a material like cotton-seed meal; for corn, small grains and grasses 200 to 300 pounds, and for legumes 60 to 100 pounds per acre. Other suitable nitrogenous materials may be substituted for the meal in the proportions given above if desirable to do so.

When potash is the normal price it will usually pay to use something like 2 to 4 per cent in the mixture for corn, cotton, small grains, and grasses, and 3 to 4 per cent for leguminous crops.

As the amount of organic matter turned back into the soil increases, the amount of cotton-seed meal or other nitrogenous material in the above mixtures may be reduced. In fact, when the supply has become liberal in the soil it may be possible to entirely leave out of the mixture any nitrogen-carrying material. It should be the aim of the farmers of the county, as nearly as practicable, to obtain this condition with their soils. Even though these soils do not respond to applications of phosphoric acid at the present time, and none has been recommended, yet as time goes on and the amount in these soils become less and less it will in the course of time become necessary and profitable to use this constituent. At the present time this is not necessary nor profitable. Generally, one of the greatest needs of these soils, especially those of the Iredell loam, is the addition of organic matter. Because of their color it is hard to determine by observation purely whether they contain much or little of this material.

CROP ROTATION NECESSARY FOR A PERMANENT SYSTEM OF AGRICULTURE IN THE COUNTY

It is the duty of every owner of farm lands in the county to follow methods of crop rotation and fertilization that shall maintain the producing power of fertile soils and which shall build up the poorer ones. The methods in common used by farmers should be such that their soils would become more productive year by year. The investigations that have been carried on by the Division of Agronomy in previous years have been conducted primarily to determine the most economical meth-

ods of fertilizing the various soil types of this and other counties of the State, and to take the information thus secured and apply it in conjunction with systems of crop rotation for the purpose of increasing the producing power of the soils. From information thus secured we are able to recommend methods which, if followed by the farmers of Mecklenburg County, will maintain their soils in a far more productive state than they are at the present time, using the methods that are commonly in practice. In providing the necessary plant-food constituents as recommended above for the different types, it is necessary to adopt a proper system of crop rotation if the largest and most profitable returns per acre are to be secured. The following rotations are recommended as adapted for conditions prevailing in the county:

First Year.—Corn, with soybeans and cowpeas drilled in row at planting or before the first cultivation. They also may be sown broadcast just before last cultivation.

Second Year.—Wheat or oats, red clover.

Third Year.—Red clover.

This is a short rotation and is admirably adapted to the grain farms of the county. The corn stover and wheat straw should be plowed under or fed to stock, and the manure carefully saved and returned to the soil. The soybeans or cowpeas and last crop of red clover should be turned under.

In starting this rotation on average soils of all the types, except Iredell loam, Congaree fine sandy loam, Mecklenburg clay loam, and Mecklenburg loam, it is recommended that an application of 200 to 400 pounds of acid phosphate be used under the corn, and that 75 to 100 pounds of nitrate of soda be used as a top dressing later, about the first of July. If available, farm manure may be used with the phosphate and the nitrate be eliminated entirely. This fertilization applies to the more extensively tilled soils. The nitrogen application could well be reduced or left off entirely on new land or on other soils containing a goodly supply of organic matter. Unless lime has been applied within the last two or three years, an application of 2,000 pounds of ground limestone per acre should be added to those soils on which legumes are to be grown and to those containing a considerable amount of organic matter. The lime should be applied broadcast and be thoroughly incorporated with the surface soil by means of a disc or spike-tooth harrow at the time of preparing the land for a corn or wheat crop.

The first year in which wheat or oats is grown, the land should receive similar treatment to that recommended for corn. In addition to the acid phosphate it would be well to apply 200 to 400 pounds of rock phosphate per acre, as this fertilization is for both the wheat and clover crops.

An application of 600 to 800 pounds of rock phosphate per acre to a good crop of clover before it is turned under in the fall should furnish much of the phosphoric acid required by the crops of the second period of the rotation. Within a comparatively short time enough nitrogen

should be furnished by the soy beans or cowpeas, the clover and the rougage, or stable manure if crops are fed, and the manure saved and applied back on the land or the crops are plowed directly into the soil after maturity. The nitrate might be entirely dispensed with. The application of rock phosphate and lime should be made every four or five years. Live-stock farming in connection with this rotation might help in improving the productivity of these soils.

FOUR-YEAR ROTATIONS

A good four-year rotation is the same as the above, with oats and soy-beans or cowpeas following corn the second year.

Other four-year rotations which could be adopted in this county are:

First Year—Corn.

Second Year—Crimson clover and cowpeas or soybeans.

Third Year—Wheat or oats, red clover.

Fourth Year—Red Clover.

Or for sections of the county in which cotton is grown, one similar to this might be used:

First Year—Corn.

Second Year—Wheat or oats, red clover.

Third Year—Red clover.

Fourth Year—Cotton, rye.

A similar method of fertilization should be adopted, with these four-year rotations as is given for the three-year rotation.

FIVE- OR SIX-YEAR ROTATIONS

Any of these rotations, with two years of pasture added, would make them even better adapted to live-stock farming. Where it is desired to grow cotton, the following six-year rotation should, under an intelligent supplemental system of fertilization and proper cultivation, give good results:

First Year—Corn, with cowpeas in the row or sown broadcast just before the last cultivation.

Second Year—Cotton, with rye sown broadcast in the cotton after the first picking and covered with a harrow or light cultivator.

Third Year—Rye plowed under, cowpeas, wheat or oats.

Fourth Year—Wheat or oats, red clover.

Fifth Year—Red clover.

The fertilizer here, too, would be similar to that indicated above for a three-year rotation.

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ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917. MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
Brands claiming										
106	American Agricultural Chemical Co., New York, N. Y.	Grain and Grass Compound	Elkin	8.00	.87	.66	1.65	2.00	2.00	\$24.93
336	do.	Hot Stuff Vance	Henderson	7.99	.94	.74	1.68	2.04	2.29	26.50
340	do.	Planters' Special 8-2-2	Henderson	7.72	1.08	.94	2.02	2.46	2.22	27.30
339	do.	Rose Brand, 8-2-2	Henderson	7.93	1.10	.76	1.86	2.26	2.66	29.04
342	do.	Zell's Special Compound for Tobacco	Creedmoor	8.52	1.10	.60	1.70	2.07	1.94	25.36
114	American Fertilizing Co., Norfolk, Va.	Bone and Peruvian Guano	Asheboro	9.34	.51	.72	1.23	1.50	2.44	26.71
2157	do.	do.	Dunn	8.90	1.38	.34	1.72	2.09	2.10	26.62
2159	do.	do.	Dunn	8.27	1.34	.30	1.64	1.99	1.75	23.91
68	Armour Fertilizer Works, Greensboro, N. C.	Armour's Slaughter House Fertilizer	Lenoir	9.39	.23	.64	.87	1.05	1.82	22.14
2119	do.	do.	Indian Trail	8.35	1.18	.50	1.68	2.04	1.74	24.11
316	do.	do.	Vineland	8.06	1.14	.70	1.84	2.21	1.93	25.44
335	Atlantic Chemical Co., Norfolk, Va.	Atlantic Soluble Guano for Tobacco	Henderson	7.75	1.04	.76	1.80	2.19	2.08	25.71
158	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Double Plant Food	Tabor	8.05	.91	.84	1.75	2.13	2.19	26.35
81	do.	Baugh's Wheat Fertilizer for Wheat and Grass	Greenville	8.14	1.11	.86	1.97	2.40	2.48	29.08
137	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 8-2-2 Standard Grade Guano	Statesville	7.72	.93	.82	1.75	2.13	2.05	25.32
171	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano	Rutherfordton	8.49	.99	.60	1.59	1.93	2.04	25.37
2025	do.	do.	Jamesville	7.79	1.06	.62	1.68	2.04	2.02	21.95
62	Cooperative Warehouse Co., Salisbury, N. C.	Farmers' Union 8-2-2 Guano	Lincolnton	7.84	.63	.92	1.55	1.88	2.21	25.40
65	Cooperative Warehouse Co., Wilmington, N. C.	do.	Newton	7.34	.66	.76	1.42	1.73	1.66	21.60
199	Coweta Fertilizer Works, Newman, Ga.	Coweta Success Guano	Mount Gilead	8.69	1.22	.48	1.70	2.07	2.39	27.78
2177	Craven Chemical Co., New Bern, N. C.	E-Lite Cotton Guano	Kinston	8.83	.26	1.18	1.44	1.75	2.00	24.88
131	Georgia Chemical Works, Augusta, Ga.	Georgia Formula	No. Wilkesboro	8.55	.59	.84	1.43	1.74	1.38	21.46
2064	do.	Patapasco Ammoniated Dissolved Bone	Lumber Bridge	7.39	1.28	.50	1.78	2.16	2.10	25.37

99	Imperial Co., Norfolk, Va.	Imperial Standard Premium Guano.	8.22	1.21	.58	1.79	2.18	1.97	25.59
209	Navassa Guano Co., Wilmington, N. C.	Navassa Cotton Fertilizer.	9.88	1.00	.54	1.54	1.87	1.83	25.80
2022	do.	Navassa Oconeechee Tobacco Guano.	8.40	1.14	.44	1.58	1.92	2.31	26.59
2122	N. C. Farmers' Union, Statesville, N. C.	N. C. Farmers' Union 8-2-3 Tobacco Guano.	8.97	1.40	.36	1.76	2.14	1.71	24.91
112	Old Buck Guano Co., Richmond, Va.	Old Buck Warsaw.	8.39	1.03	.68	1.71	2.08	1.98	25.47
47	Old Dominion Guano Co., Richmond, Va.	Old Dominion Guano Co.'s Soluble Guano.	8.97	1.27	.58	1.85	2.25	1.74	25.44
2061	Patapco Guano Co., Baltimore, Md.	Planters' Favorite.	8.01	1.08	.60	1.68	2.04	1.92	24.67
312	Peruvian Guano Corporation, Charleston, S. C.	Standard Peruvian Mixture.	7.99	1.04	.58	1.62	1.97	1.90	24.29
323	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Tobacco.	8.53	1.14	.52	1.66	2.02	1.80	24.59
270	Powhatan Chemical Co., Richmond, Va.	Magic Tobacco Grower.	7.77	1.14	.66	1.80	2.19	1.93	21.98
178	Rasin-Monumental Co., Baltimore, Md.	Rasin's Empire Guano.	9.03	1.09	.54	1.63	1.98	1.72	24.43
2063	Read Phosphate Co., Charleston, S. C.	Read's Blood and Bone Fertilizer, No. 1.	7.75	.90	.54	1.44	1.75	1.84	23.03
129	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bone Fertilizer for Tobacco, F. S. R.	8.29	.89	.70	1.59	1.93	1.97	24.82
2105	do.	Royster's Farmers' Bone Fertilizer.	8.01	1.14	.82	1.96	2.38	1.91	25.91
2196	do.	do.	8.03	.94	.64	1.53	1.92	1.92	24.27
281	do.	do.	7.98	1.10	.54	1.64	1.93	1.85	24.17
174	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Red Steer Standard Grade Guano.	9.08	.71	.88	1.59	1.93	1.93	25.41
156	do.	do.	9.15	.09	1.40	1.49	1.81	1.72	24.01
45	Tidewater Guano Co., Norfolk, Va.	Double Action Soluble Guano.	7.48	1.31	.30	1.61	1.95	1.82	23.34
91	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Standard for Grain.	9.76	.23	.26	.49	.60	1.61	19.87
57	Union Guano Co., Charlotte, N. C.	Old Honesty Guano.	8.74	1.17	.56	1.73	2.10	1.80	25.01
304	Union Guano Co., Winston-Salem, N. C.	Fish Brand Ammoniated Guano for Tobacco.	9.00	1.40	.42	1.82	2.21	2.07	26.99
43	do.	do.	8.84	1.03	.58	1.61	1.94	2.21	26.55
73	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand Guano.	7.79	1.25	.76	2.01	2.44	2.34	27.93
2001	do.	do.	8.89	.42	1.04	1.46	1.78	2.02	25.12
346	do.	do.	8.74	1.12	.50	1.62	1.97	1.93	25.44
60	do.	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	8.91	1.29	.46	1.75	2.13	2.08	26.69
88	do.	Eureka Ammoniated Bone.	9.10	1.53	.36	1.89	2.30	2.79	30.99
222	do.	Norfolk and Carolina Chemical Co.'s Genuine Slaughterhouse Bone Guano, C. S. M.	8.10	.80	1.10	1.90	2.31	1.70	24.58
240	do.	Old Dominion Guano Co.'s Soluble Tobacco Guano.	9.32	1.48	.32	1.80	2.19	1.74	25.58
125	do.	Soluble Guano.	7.90	1.61	.36	1.97	2.40	2.85	30.42

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
Brands claiming										
125	Va.-Car. Chemical Co., Richmond, Va.	Soluble Guano.	Ramsaur.	8.00	1.61	.36	1.65	2.00	2.00	\$24.93
2059	do.	Stonewall Guano.	Windsor.	7.90	1.54	.56	1.97	2.40	2.85	30.42
154	do.	S. W. Travers & Co.'s Beef, Blood, and Bone Fertilizer.	Andrews.	7.75	1.51	.66	2.10	2.55	1.83	25.72
				8.86	1.51	.66	2.17	2.64	2.41	30.02
273	do.	Va.-Car. Chemical Co.'s Farmers' Favorite Fertilizer, C. S. M.	Kenly.	8.80	1.16	.82	1.98	2.41	2.08	27.52
166	do.	do.	Wallace.	8.66	.41	1.40	1.81	2.20	1.94	25.96
Brand claiming										
2062	Navassa Guano Co., Wilmington, N. C.	Navassa Guano for Tobacco.	Walnut Cove.	8.00	1.52	.42	2.05	2.50	2.00	26.65
Brand claiming										
2102	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Oriana Tobacco Guano.	Williamston.	8.00			2.06	2.50	3.00	31.65
				7.67	1.26	.74	2.00	2.43	2.89	30.52
Brands claiming										
266	Harris Cooperative Co., Wilson, N. C.	Harris Complete Guano, Meal Body.	Wilson.	8.00			2.47	3.00	1.00	23.37
2010	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's 3-8-1 Fertilizer.	Robersonville.	8.10	1.24	1.26	2.50	3.04	1.14	24.30
269	Ober, G., & Sons Co., Baltimore, Md.	Ober's Golden Seal Tobacco Guano.	Fremont.	8.37	2.04	.46	2.50	3.04	1.08	24.27
244	Richmond Guano Co., Richmond, Va.	Gilt Edge Tobacco Special.	Spring Hope.	8.12	1.48	1.14	2.62	3.19	1.37	25.97
219	Va.-Car. Chemical Co., Richmond, Va.	V.-C. Co.'s Farmers' Friend High Grade Fertilizer, Revised.	Washington.	8.16	1.78	.68	2.46	2.99	1.19	24.41
				7.20	1.26	1.18	2.44	2.97	1.15	23.20
Brands claiming										
338	American Agricultural Chemical Co., New York, N. Y.	High Grade Tobacco Manure, Vance.	Henderson.	8.00			2.47	3.00	2.00	28.37
				8.27	1.14	1.30	2.44	2.97	2.33	30.17
205	do.	Lazaretto Special Tobacco and Potato Fertilizer.	Walstonburg.	7.70	1.64	.74	2.38	2.89	1.79	26.72
201	Baugh & Sons Co., Philadelphia, Pa.	Baugh's High Grade Tobacco Guano.	Goldsboro.	8.15	1.02	.82	2.44	2.97	2.32	30.00
2011	do.	do.	Robersonville.	8.00	1.74	.66	2.40	2.92	2.26	29.38

2176	do.....do.....	Fort Barnwell.....	7.76	1.66	.78	2.44	2.97	2.16	28.81
276	do.....do.....	Kinston.....	8.00	1.70	.72	2.42	2.91	2.11	28.71
825	Columbia Guano Co., Norfolk, Va.....	Columbia Tally Ho Tobacco Guano.....	7.95	1.74	.76	2.59	3.01	2.06	28.75
203	Contentnea Guano Co., Wilson, N. C.....	Special Tobacco Grower.....	7.74	.90	1.49	2.30	2.89	1.33	24.05
264	Craven Chemical Co., New Bern, N. C.....	C. C. Co.'s Tobacco Special, Revised.....	8.27	1.36	.88	2.24	2.72	1.74	26.38
2041	Farmers Fertilizer Works, Spartanburg, S. C.....	Red Rooster Fertilizer.....	8.63	1.58	.80	2.38	2.89	1.93	28.28
2042	do.....do.....	do.....do.....	8.47	1.58	.76	2.34	2.84	1.77	27.15
288	Georgia Chemical Works, Augusta, Ga.....	Gold Leaf Tobacco Compound, Revised.....	8.32	1.60	.88	2.48	3.02	2.01	29.06
2089	Imperial Company, Norfolk, Va.....	Imperial X. L. O. Crop Grower.....	8.34	1.78	1.22	3.09	3.65	1.59	28.89
2052	Navassa Guano Co., Wilmington, N. C.....	Clarendon Tobacco Guano, Revised.....	9.01	1.54	.96	2.50	3.01	1.85	28.76
2108	do.....do.....	do.....do.....	7.93	.88	1.98	2.86	3.48	2.06	30.24
2182	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.....	Special Meal and Fish Guano.....	8.22	1.68	1.16	2.84	3.45	2.19	29.81
268	Ober, G., & Sons Co., Baltimore, Md.....	Spear Head Tobacco Guano.....	8.23	1.22	1.26	2.48	3.02	1.89	28.10
2005	Pamlico Chemical Co., Washington, N. C.....	Pamlico Prosperity Tobacco Guano.....	8.07	1.70	.60	2.35	2.87	1.72	26.58
246	Patasco Guano Co., Baltimore, Md.....	Patasco High Grade Tobacco Special.....	8.82	1.06	1.22	2.28	2.77	1.83	27.85
2006	Phillips Fertilizer Co., Washington, N. C.....	Phillips High Grade Tobacco Guano, 3-8-2.....	7.61	1.82	.62	2.44	2.97	2.07	28.21
285	Powhatan Chemical Co., Richmond, Va.....	Special Tobacco Fertilizer.....	8.19	1.82	.84	2.66	3.23	1.95	29.16
282	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Delta Tobacco Fertilizer, F. S. R.....	7.80	1.40	.88	2.28	2.77	2.06	27.63
2004	do.....do.....	do.....do.....	7.89	1.72	.50	2.22	2.70	2.24	28.41
318	Union Guano Co., Winston, N. C.....	Victor High Grade Tobacco Fertilizer, Revised.....	8.69	2.00	1.16	3.16	3.81	1.90	31.46
2057	Va.-Car. Chemical Co., Richmond, Va.....	Bright Leaf Tobacco Grower, Revised.....	8.50	2.18	.24	2.42	2.94	2.11	29.21
277	do.....do.....	do.....do.....	8.59	1.03	1.42	2.45	2.93	1.92	28.48
165	do.....do.....	V.-C. Co.'s 3 Per Cent C. S. M. Guano.....	8.00			2.47	3.00	3.00	33.37
	Brands claiming.....		8.37	1.42	1.42	2.84	3.45	3.03	35.45
341	American Agricultural Chemical Co., New York, N. Y.....	Fish Brand, Vance.....	8.77	1.62	.78	2.40	2.92	3.31	35.19
204	American Fertilizing Co., Norfolk, Va.....	American Guano.....	8.14	1.20	1.34	2.51	3.03	3.03	33.96
2026	Armour Fertilizer Works, Wilmington, N. C.....	Armour's Tobacco Special Fertilizer.....	8.95	1.66	1.02	2.68	3.26	2.67	33.56
315	do.....do.....	do.....do.....	8.75	1.57	.88	2.45	2.93	3.06	34.31
157	Baugh & Sons Co., Philadelphia, Pa.....	Baugh's Three-score Complete Fertilizer.....	8.75	1.50	.82	2.32	2.82	2.92	32.71
2081	Berkley Chemical Co., Norfolk, Va.....	Berkley Tobacco Guano.....	7.84	1.90	.80	2.70	3.28	2.95	33.98
261	Columbia Guano Co., Norfolk, Va.....	Columbia Hyco Tobacco Guano.....	9.12	1.80	.34	2.14	2.60	2.90	32.61
308	Navassa Guano Co., Wilmington, N. C.....	Clarendon Tobacco Guano.....	8.65	.86	1.78	2.61	3.21	2.62	32.81
2183	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.....	Lenoir Bright Leaf Tobacco Grower.....	7.82	1.60	.90	2.50	3.04	3.36	35.12
324	Ober, G., & Sons Co., Baltimore, Md.....	Royal Crown Tobacco Guano.....							

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
Brands claiming										
2006	Old Buck Guano Co., Richmond, Va.....	Old Buck Quincy Tobacco and Garden Meal Body.	Williamston.....	8.00	1.40	1.20	2.47	3.00	3.00	\$33.37
2067	Pearsall & Co., Wilmington, N. C.....	Pearsall's High Grade Guano.....	Red Springs.....	8.26	1.00	1.14	2.14	2.60	3.26	32.94
214	Pocomoke Guano Co., Norfolk, Va.....	Monarch Tobacco Grower.....	Edenton.....	7.53	1.44	1.18	2.62	3.19	2.63	31.93
2085	do.....	do.....	Pink Hill.....	8.17	1.74	.68	2.42	2.94	2.55	31.03
321	Powhatan Chemical Co., Richmond, Va.....	P. C. Co.'s Hustler.....	Kinston.....	7.94	2.00	.46	2.46	2.99	3.25	34.32
2247	Robeson Mfg. Co., Lumberton, N. C.....	Silver Dollar.....	Hope Mills.....	7.99	2.24	1.18	3.42	4.16	2.93	37.00
280	Royster, F. S., Guano Co., Norfolk, Va.....	Royster Bonanza Tobacco Guano, F.S.R.	Kinston.....	7.83	1.76	.48	2.24	2.72	3.26	33.51
2184	do.....	do.....	Fort Barnwell.....	8.24	1.82	.64	2.46	2.99	2.95	33.32
2101	do.....	do.....	Williamston.....	8.97	.84	1.44	2.28	2.77	2.96	33.35
2068	do.....	do.....	Cove City.....	7.96	1.76	.70	2.46	2.99	2.97	33.14
330	Va.-Car. Chemical Co., Richmond, Va.....	Norfolk and Car. Chem. Co.'s Amazon High Grade Special Tobacco Guano. Norfolk and Carolina Chemical Co.'s High Grade Manure.	Littleton.....	8.42	2.30	.48	2.78	3.38	2.45	32.40
169	do.....	do.....	Mount Olive.....	8.74	.95	1.60	2.55	3.10	2.82	33.55
303	do.....	do.....	Mount Tabor.....	8.38	1.22	.94	2.16	2.63	2.90	31.95
2099	do.....	V.-C. C. Co.'s Menhaden Fish and Meal Mixture.	Williamston.....	8.23	1.10	1.46	2.56	3.11	2.78	32.88
	do.....	V.-C. C. Co.'s Owl Brand Guano for Tobacco, C. S. M.								
Brand claiming										
2030	Pearsall & Co., Wilmington, N. C.....	Pearsall's High Grade Tobacco Guano.....	Clarkton.....	8.00			2.47	3.00	5.03	43.37
Brand claiming										
2221	Farmville Oil and Fertilizer Co., Farmville, N.C.	Fish and Meal Special Formula.....	Farmville.....	7.62	1.20	1.34	2.54	3.00	4.55	41.04
				8.00			3.23	4.00	.80	24.32
				8.59	1.86	1.48	3.34	4.06	.72	26.23

2033	Brands claiming Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 8-4-1	Marietta	8.00	2.01	1.10	3.29	4.02	1.03	26.82
2050	Eastern Cotton Oil Co., Hertford, N. C.	Mat. White's Special for Corn and Cotton	Moyock	9.02	1.32	1.60	2.92	3.55	1.16	26.16
2107	Royster, F. S., Guano Co., Norfolk, Va.	Columbia Aurora Fertilizer	Roper	7.91	2.28	.90	3.18	3.87	1.23	27.07
250	Union Seed and Fertilizer Co., Wilmington, N. C.	Brand No. 15	Parkton	8.66	.51	2.59	3.01	3.70	1.02	26.53
228	Brands claiming Baugh & Sons Co., Norfolk, Va.	Baugh's Peruvian Guano Substitute	Elizabeth City	8.00	---	---	4.11	5.00	1.03	30.23
354	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Gothic Truck Compound	Elizabeth City	9.14	3.18	.76	3.91	4.73	.93	30.41
227	Brands claiming Baugh & Sons Co., Norfolk, Va.	Baugh's Tri-unit Potato Guano	Elizabeth City	8.00	---	---	4.11	5.00	3.00	40.23
299	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special Formula High Grade 8-5-3	Elizabeth City	8.23	3.23	.70	3.92	4.74	3.21	41.72
237	Brand claiming Pocomoke Guano Co., Norfolk, Va.	Pocomoke 7-8-1	Elizabeth City	7.28	1.88	2.16	4.01	4.91	2.43	35.25
272	Brand claiming Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Anchor Brand Tobacco Fertilizer	Kenly	8.05	1.80	2.32	4.12	5.01	1.63	33.83
172	Brand claiming Navassa Guano Co., Wilmington, N. C.	Navassa Wheat Fertilizer	Forest City	8.50	---	---	2.25	2.75	2.03	27.93
115	Brands claiming Georgia Chemical Works, Augusta, Ga.	Georgia Bell Compound	Ashboro	8.43	2.14	.32	2.46	2.93	1.91	23.43
132	do.	do.	No. Wilkesboro	9.00	---	---	.82	1.00	1.03	17.41
102	Rasin-Monumental Co., Baltimore, Md.	Baltimore Special Mixture	Milton	11.98	.13	.60	.73	.83	2.23	23.23
58	Royster, F. S., Guano Co., Norfolk, Va.	Beeson Special Fertilizer	Ashboro	9.03	---	---	.82	1.00	2.02	22.41
44	Union Guano Co., Winston, N. C.	Carolina Grain Grower	Cherryville	9.58	.35	.51	.81	1.08	1.73	22.50
20	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Little Giant Grain and Grass Grower	Taylorsville	8.92	4.5	.51	.90	1.23	1.61	21.23
110	Brands claiming Armour Fertilizer Works, Greensboro, N. C.	Armour's No. 9-2-1 for Grain Fertilizer	Climax	9.98	.51	.50	1.01	1.33	1.61	22.61
136	do.	Armour's No. 9-2-1 Fertilizer	Newton	9.40	.43	.41	.87	1.03	1.90	22.55
224	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Base Potash Compound	Edenton	9.96	.53	.40	.93	1.13	1.97	23.72
6	Baugh & Sons Co., Norfolk, Va.	Baugh's Bone and Potash Mixture	Burlington	9.16	.79	.21	1.03	1.25	1.91	23.19
121	Lister's Agricultural Chemical Works, Newark, N. J.	Lister's Standard Superphosphate	Siler City	9.00	---	---	1.65	2.03	1.03	20.93
66	do.	do.	Ashboro	8.42	.67	1.01	1.71	2.08	1.53	21.10
211	Navassa Guano Co., Wilmington, N. C.	Navassa Complete Fertilizer	Mount Holly	9.13	.95	.61	1.53	1.93	.53	18.37
111	Old Buck Guano Co., Richmond, Va.	Old Buck Clark's Wheat Formula	Edenton	8.87	1.21	.78	2.02	2.46	1.27	21.30
104	Reidsville Fertilizer Co., Reidsville, N. C.	Reidsville Big Crop Guano	Burlington	8.93	.61	.88	1.43	1.81	1.10	23.75
			Siler City	9.16	1.25	.60	1.85	2.25	1.03	22.2
			Newton	8.99	1.03	.50	1.50	1.93	.90	20.42
			Newton Grove	10.05	1.30	.38	1.68	2.01	1.05	22.36
			Ashboro	9.25	.85	.72	1.57	1.91	1.53	23.49
			Mount Airy	8.82	1.21	.38	1.53	1.93	.85	19.75

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
Brands claiming										
181	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Honey Bee Special Compound	Catawba	9.00			1.65	2.00	1.00	\$20.93
37	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Cotton Plant Standard Guano	Hendersonville	9.52	1.01	.74	1.75	2.13	1.16	22.67
59	Union Guano Co., Winston, N. C.	Q. & Q., Quality and Quantity Guano	Waco	9.49	.05	1.40	1.45	1.76	.94	20.28
42	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Guano	Clyde	10.02	1.21	.60	1.81	2.20	.93	22.27
100	Venable Fertilizer Co., Richmond, Va.	Venable Bone Special	Ruffin	10.73	.79	.68	1.47	1.79	.98	21.80
Brand claiming										
2028	Union Seed and Fertilizer Co., Wilmington, N. C.	U. S. and F. Co.'s Brand No. 3	Marietta	9.00			2.26	2.75	.50	20.99
				10.00	.62	1.48	2.10	2.55	.73	22.47
Brand claiming										
2138	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Monticello Animal Bone Special	Robersonville	9.00			1.85	2.25	2.00	26.77
				9.39	.90	1.12	2.02	2.46	1.44	25.07
Brands claiming										
2024	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Tobacco and Cotton Grower	Williamston	9.00			2.26	2.75	2.00	28.49
				9.49	1.38	1.18	2.56	3.11	1.76	29.04
2020	Columbia Guano Co., Norfolk, Va.	Columbia C. S. M. Special	Jamesville	9.08	.82	1.38	2.20	2.67	1.88	27.72
265	Harris Cooperative Co., Wilson, N. C.	Harris' Meal Mixture	Wilson	9.12	1.08	1.44	2.52	3.06	2.36	31.50
197	Navassa Guano Co., Wilmington, N. C.	Manipulated Guano	Nashville	9.98	1.32	.90	2.22	2.70	2.12	29.90
245	Rasin-Monumental Co., Baltimore, Md.	Rasin's Dixie Tobacco Guano	Nashville	8.40	.90	1.30	2.20	2.67	2.13	28.29
243	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Meal Mixture, F. S. R.	Rocky Mount	9.52	.74	1.42	2.16	2.63	1.98	28.49
2104	do.	do.	Williamston	8.82	.78	1.50	2.28	2.77	1.92	28.03
241	Southern Cotton Oil Co., Rocky Mount, N. C.	Goldsboro Cotton Grower, C. S. M.	Rocky Mount	7.51	.58	1.68	2.26	2.75	2.14	27.70
2035	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Special Tobacco Manure	Marietta	9.97	1.76	.54	2.30	2.80	1.95	29.38
238	do.	V.-C. C. Co.'s Prolific Cotton Grower, C. S. M.	Rocky Mount	9.59	1.24	.96	2.20	2.67	2.06	29.13

196	do.	do.	do.	9.45	.70	1.52	2.22	2.70	1.90	28.27
239	do.	V.-C. C. Co.'s Standard Cotton Grower	Nashville	8.41	.88	1.32	2.20	2.67	2.23	28.80
2002	do.	V.-C. C. Co.'s White Stem C. S. M.	Williamston	8.77	.91	1.40	2.34	2.81	2.14	29.40
2100	do.	do.	Williamston	9.44	.78	1.60	2.38	2.89	1.91	29.11
	Brand claiming			9.00			2.47	3.00	2.07	23.37
248	An erican Agricultural Chemical Co., New York, N. Y.	Vance Pest Grade Tobacco Manure	Spring Hope	9.20	1.50	1.08	2.58	3.14	2.63	33.19
	Brands claiming			10.00			.82	1.00	1.07	18.44
35	Armour Fertilizer Works, Greensboro, N. C.	Armour's No. 1011 for Grain	Henders-onville	10.79	.47	.34	.81	.93	1.01	19.21
103	Georgia Chemical Works, Augusta, Ga.	Georgia Special 10-1-1 Ammoniated Mixture	Mount Airy	10.46	.15	.72	.87	1.06	.75	17.83
9	Imperial Company, Norfolk, Va.	Imperial 1-10-1 Fertilizer	Burlington	9.88	.47	.50	.97	1.18	1.11	19.59
175	Navassa Guano Co., Wilmington, N. C.	Navassa Wheat Belt Guano	Lawndale	11.74	.27	.42	.69	.81	.92	19.21
50	Patafeso Guano Co., Baltimore, Md.	Coon Brand Guano, 1916	Moorestville	10.32	.65	.30	.95	1.16	.94	19.01
89	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Plow Boy Guano	Clyde	10.57	.09	1.14	1.23	1.50	1.39	22.69
	Brand claiming			10.00			.20	.24	2.07	20.84
19	Armour Fertilizer Works, Greensboro, N. C.	Armour's Special Grain Fertilizer	Candler	10.25	.19	.22	.41	.50	1.79	20.92
	Brands claiming			10.00			.62	.75	2.07	22.60
109	Armour Fertilizer Works, Greensboro, N. C.	Armour's Grain Fertilizer	Asheboro	9.65	.27	.32	.59	.72	1.06	21.93
149	do.	do.	Kings Mountain	10.14	.27	.36	.63	.77	1.76	21.59
134	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Special Grain Fertilizer	Concord	10.24	.19	.44	.63	.77	2.02	22.99
	Brand claiming			10.00			.82	1.00	2.00	23.44
10	Imperial Company, Norfolk, Va.	Imperial 1-10-2 Fertilizer	Burlington	10.07	.43	.50	.93	1.13	1.97	23.83
	Brands claiming			7.00			4.11	5.00	1.00	29.62
2110	Imperial Company, The, Norfolk, Va.	Imperial Fertilizer	Travis	7.94	2.68	1.02	3.70	4.50	1.06	28.78
235	Royster, F. S., Guano Co., Norfolk, Va.	Royster's E. & Pa. 5 Per Cent Potato Guano	Elizabeth City	7.02	2.82	1.12	3.94	4.79	1.23	29.72
300	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special Early Truck High Grade 7-5-1	Elizabeth City	6.31	2.26	1.72	3.98	4.84	1.00	28.03
2161	Va.-Car. Chemical Co., Richmond, Va.	V.-C. Konqueror High Grade Truck	South Mills	7.09	3.38	.68	4.05	4.94	1.15	29.89
	Brands claiming			7.00			4.11	5.00	2.00	34.26
2218	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Potato Compound	New Bern	7.77	1.30	1.66	2.96	3.60	1.45	27.45
301	Pamlico Chemical Co., Washington, N. C.	Pamlico Potato Guano	Elizabeth City	6.81	3.18	.96	4.11	5.03	2.18	35.10
355	Pocomoke Guano Co., Norfolk, Va.	Pocomoke 5-7-2 Fertilizer	Jarvisburg	7.07	2.94	1.20	4.14	5.03	1.98	34.36
296	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Southern Truck High Grade 7-5-2	Elizabeth City	5.97	1.00	3.40	4.40	5.35	1.74	33.15
	Brand claiming			7.00			4.11	5.00	3.00	39.26
230	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Complete Truck, High Grade	Elizabeth City	7.13	1.62	2.26	3.88	4.72	2.36	35.23

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory		
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		Potash	
	Brands claiming			6.00				3.29	4.00	2.03	\$9.82
2097	Phillips Fertilizer Co., Washington, N. C.	Phillips' Truck Guano for All Vegetables.	Washington.	6.05	1.34	1.60	2.94	3.57	1.98	23.30	
	Brand claiming			6.00			4.11	5.00	1.03	28.30	
2084	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s 6-5-1 Guano.	Elizabeth City.	6.22	3.34	.44	3.78	4.60	1.16	27.90	
	Brand claiming			6.00			4.11	5.00	2.03	33.26	
2093	Armour Fertilizer Works, Greensboro, N. C.	Armour's Fertilizer, No. 6-5-2.	Elizabeth City.	5.57	2.41	1.16	3.60	4.33	1.63	23.99	
	Brand claiming			6.00			5.76	7.03	1.00	35.19	
297	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special High Grade Truck.	Elizabeth City.	6.06	3.28	2.06	5.34	6.49	.94	31.19	
	Brand claiming			6.00			9.01	10.99	1.03	43.97	
2039	Nitrate Agencies Co., New York, N. Y.	N. A. C. Brand Peruvian Guano.	Fayetteville.	9.56	3.92	5.00	8.92	10.84	1.94	56.72	
	Brand claiming			4.00			9.05	11.00		42.01	
2145	Navassa Guano Co., Wilmington, N. C.	Navassa Dry Fish.	Robersonville.	4.85			9.21	11.23		43.66	
	Brand claiming			5.00			4.11	5.03		22.30	
167	Navassa Guano Co., Wilmington, N. C.	Carr's Fish Ammoniated Phosphate.	Wallace.	4.82	3.33	.42	3.75	4.58		20.57	
	Brands claiming			6.03			3.29	4.03		19.82	
317	Acme Mfg. Co., Wilmington, N. C.	Acme 6-4 Fertilizer.		5.98	1.62	1.18	2.80	3.40		17.74	
2073	American Agricultural Chemical Co., New York, N. Y.	Carolina Formula.	Hope Mills.	6.22	3.30	.84	4.11	5.03		23.61	
	do.	do.									
2048	do.	do.	St. Paul.	6.24	1.98	1.24	3.22	3.91		19.76	
2074	do.	do.	Hope Mills.	6.10	2.36	.74	3.10	3.77		19.12	
2072	do.	do.	Hope Mills.	6.07	2.28	.80	3.03	3.74		19.01	
2079	Berkley Chemical Co., Norfolk, Va.	Berkley 6-4 Fertilizer.	Dunn.	6.12	2.40	.86	3.23	3.93		19.81	
2075	Bowker Fertilizer Co., Boston, Mass.	Bowker's 6-4 Fertilizer.	Hope Mills.	6.69	2.18	.90	3.03	3.74		19.63	
2032	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 6-4 Ammoniated Phosphate.	Marietta.	7.22	1.42	1.76	3.18	3.87		20.58	
2035	Conestee Chemical Co., Wilmington, N. C.	Conestee 6-4 Fertilizer.	Marietta.	6.10	1.78	1.14	2.92	3.55		18.36	

118	do.	do.	Morven	6.31	1.66	1.16	2.82	3.43	18.15
193	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co.'s 6-4 Fertilizer	Fayetteville	6.39	2.26	.76	3.02	3.67	13.07
207	do.	do.	Laurinburg	5.67	1.74	.20	2.94	3.57	18.02
091	Eastern Cotton Oil Co., Hertford, N. C.	Winslow's Special	Moyock	6.40	1.68	1.05	2.74	3.33	18.10
201	Farrers Guano Co., Raleigh, N. C.	6-4 Ammoniated Phosphate	Red Springs	6.51	2.76	.60	3.36	4.01	23.65
255	Imperial Company, Norfolk, Va.	Imperial 4-6 Fertilizer	Parkton	7.03	2.56	.88	3.41	4.13	21.48
013	do.	do.	Greenville	6.72	2.44	.56	3.03	3.65	18.32
146	Jossey, N. B., Guano Co., Tarboro, N. C.	Jossey's 6-4 Fish Scrap	Bethel	6.14	1.76	1.18	2.94	3.57	18.43
191	McNair Phosphate Co., Laurinburg, N. C.	6-4 Ammoniated Guano	Fayetteville	6.88	1.90	.90	2.83	3.43	18.61
150	Norfolk Fertilizer Co., Norfolk, Va.	Oriana Fertilizer	Fayetteville	6.23	2.56	.40	2.93	3.60	18.70
2220	Patapasco Guano Co., Baltimore, Md.	Old North State Mixture	Snow Hill	6.55	1.50	1.68	3.18	3.87	19.91
2137	Pocomoke Guano Co., Norfolk, Va.	Pocomoke 4-6 Fertilizer	Robertsonville	6.19	.94	2.08	3.02	3.67	18.87
2187	Robertson Fertilizer Co., Norfolk, Va.	Robertson 4-6 Fertilizer	Fayetteville	5.89	.74	2.34	3.03	3.74	18.83
2195	Va.-Car. Chemical Co., Richmond, Va.	V.-C. Ammoniated Compound	Red Springs	6.25	2.16	.88	3.01	3.70	23.02
2062	Brands claiming	Columbia Coblin Ammoniated Phosphate	Elizabeth City	6.00			4.11	5.03	23.23
350	Columbia Guano Co., Norfolk, Va.	Royster's Tulip 5 Per Cent Ammoniated Phosphate	Powell's Point	6.33	2.82	1.14	3.93	4.81	22.93
225	Royster, F. S., Guano Co., Norfolk, Va.	V.-C. Co.'s Ammoniated Superphosphate	Elizabeth City	6.00	3.60	1.22	4.23	5.20	23.98
2054	Va.-Car. Chemical Co., Richmond, Va.	Brands claiming	Elizabeth City	6.78	3.18	.74	3.92	4.77	23.21
294	Robertson Fertilizer Co., Norfolk, Va.	Robertson's 7-6 Guano	Bethel	6.00			5.75	7.03	30.13
293	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Trucking Compound, High Grade	Elizabeth City	6.18	3.32	2.10	5.42	6.51	23.91
289	U. S. Fertilizer Co., Norfolk, Va.	U. S. Fertilizer Co., Norfolk, Va.	Elizabeth City	5.81	2.50	3.14	5.64	6.83	23.50
2017	Brands claiming	Imperial Fertilizer	Elizabeth City	5.89	3.36	2.36	5.72	6.95	29.91
2044	Imperial Company, Norfolk, Va.	Imperial Fertilizer	Elizabeth City	7.03			4.11	5.03	24.23
2046	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Virginia Potato Grower, High Grade	Elizabeth City	7.32	2.82	1.02	3.84	4.67	23.45
16	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Special Ammoniated Phosphate	Red Springs	7.00	1.96	2.06	4.02	4.83	23.83
327	do.	do.	Red Springs	7.50			3.70	4.53	23.01
2150	Va.-Car. Chemical Co., Richmond, Va.	Mammoth Ammoniated Compound	Waynesville	8.96	1.03	2.54	3.65	4.33	21.75
232	Brands claiming	Baugh's Nonpotash Mixture	Waynesville	8.86	.92	2.48	3.40	4.13	23.14
232	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Special Ammoniated Phosphate	Waynesville	8.03			1.65	2.03	14.93
232	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special A, Low Grade 8-3	Waynesville	10.75	1.23	.51	1.83	2.22	18.11
232	do.	do.	Waynesville	8.00			2.47	3.03	18.37
232	Brands claiming	Baugh's Nonpotash Mixture	Kinston	9.01	1.46	.92	2.33	2.83	13.01
232	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Special Ammoniated Phosphate	Fayetteville	8.44	1.32	1.78	3.10	3.77	21.46
232	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special A, Low Grade 8-3	Elizabeth City	9.12	.86	1.40	2.25	2.75	18.61

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917. MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory	
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		Total Potash
Brands claiming										
168	Aene Mfg. Co., Wilmington, N. C.	Aene 8-4 Special Fertilizer	Mount Olive	8.00		1.91	1.94	3.29	4.00	\$1.82
202	do.	do.	Goldsboro	8.12		1.22	1.48	2.70	3.23	21.43
2045	American Agricultural Chemical Co., New York, N. Y.	Ammoniated Fertilizer	St. Paul	8.06		2.24	.92	3.16	3.84	21.33
2160	American Fertilizer Co.; Norfolk, Va.	American 8-4 Ammoniated Compound	Duke	8.41		2.62	.82	3.44	4.18	22.86
2155	do.	do.	Dunn	8.35		2.54	.72	3.26	3.95	22.01
183	do.	do.	Dunn	8.10		2.27	.86	3.13	3.81	21.25
348	do.	do.	Wadesboro	8.59		1.94	.66	2.60	3.16	19.51
2154	Armour Fertilizer Works, Wilmington, N. C.	Armour's Ammoniated Superphosphate	Fayetteville	8.44		1.88	1.54	3.42	4.16	22.80
329	Baugh & Sons Co., Norfolk, Va.	Baugh's Soil and Crop Fertilizer	Kinston	8.84		2.22	1.08	3.30	4.01	22.70
2049	do.	do.	Robersonville	7.92		2.46	.84	3.30	4.01	21.78
2080	Berkley Chemical Co., Norfolk, Va.	Berkley 4-8 Fertilizer	Dunn	8.64		2.31	.86	3.20	3.83	22.08
2151	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Ammoniated Phosphate	Carvers Falls	8.60		.88	2.18	3.05	3.72	21.45
326	Columbia Guano Co., Norfolk, Va.	Columbia Big Dipper Ammoniated Phosphate.	Kinston	8.05		2.34	1.02	3.36	4.09	22.16
262	Contentnea Guano Co., Wilson, N. C.	Plant Bed Special	Fremont	7.83		1.41	1.66	3.10	3.77	20.85
257	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer's 8-4 Fertilizer	Parkton	7.90		2.02	1.01	3.05	3.72	20.75
2199	Farmers Guano Co., Norfolk, Va.	8-4 Ammoniated Phosphate	Red Springs	10.02		1.82	1.26	3.03	3.74	22.96
2200	do.	do.	Red Springs	10.36		1.88	1.06	2.94	3.57	22.71
2071	Georgia Chemical Works, Augusta, Ga.	Cardinal Ammoniated Compound	Lumber Bridge	8.12		2.50	.38	2.83	3.50	20.20
287	do.	Georgia Special 8-4 Superphosphate	Kinston	8.75		2.42	.36	2.78	3.38	20.43
2051	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's Fish Scrap Guano	Bethel	7.74		1.82	1.48	3.30	4.01	21.60
286	do.	do.	Hobgood	7.57		1.34	1.80	3.12	3.79	20.67
2124	Martin Fertilizer Co., Norfolk, Va.	Martin's Ammoniated Compound	Dunn	8.80		2.30	.86	3.16	3.84	22.07
347	Maybank Fertilizer Co., Charleston, S. C.	Maybank Ammoniated Superphosphate.	Vineland	8.22		2.78	.64	3.42	4.16	22.58

2040	McCabe Fertilizer Co., Charleston, S. C.	McCabe's Special, No. 3	Red Springs.	8.92	1.90	1.38	3.28	3.99	22.70
2046	McNair Phosphate Co., Laurinburg, N. C.	8-4.	Maxton.	8.47	1.96	1.08	3.04	3.70	21.24
2047	Meadows, E. H. & J. A. Co., New Bern, N. C.	Meadows' Ideal Special Tobacco.	Cove City.	7.30	1.18	1.56	2.74	3.33	18.81
210	Navassa Guano Co., Wilmington, N. C.	Navassa H. G. Ammoniated Superphosphate.	Newton Grove.	9.46	2.28	.44	2.72	3.31	20.83
2181	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Standard Crop Grower.	Fort Barnwell.	8.49	.86	2.06	2.92	3.55	20.75
2188	Panlico Chemical Co., Washington, N. C.	Panlico Acid-Fish Mixture.	Elizabeth City.	8.52	2.18	.86	3.04	3.70	21.23
2189	Pearsall & Co., Wilmington, N. C.	Pearsall's Bone Meal and Fish Guano.	Fayetteville.	8.03	2.10	1.14	3.24	3.94	21.64
2065	do.	do.	Linden.	8.05	1.50	1.70	3.20	3.83	21.43
2068	do.	do.	Red Springs.	8.71	1.20	1.81	3.01	3.70	21.43
2538	do.	do.	Red Springs.	7.88	1.14	1.74	3.18	3.87	21.24
2066	do.	do.	Linden.	7.85	1.56	1.60	3.16	3.84	21.12
2066	do.	do.	Red Springs.	6.24	1.20	1.91	3.14	3.82	19.43
2076	Pecoonoke Guano Co., Norfolk, Va.	Pecoonoke 4-8 Fertilizer.	Hope Mills.	8.23	2.06	1.02	3.03	3.74	21.17
2121	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Defender Ammoniated Phosphate.	Dunn.	8.08	2.50	.96	3.46	4.21	22.61
2003	do.	do.	Robersonville.	8.09	2.38	.98	3.36	4.00	22.20
2055	Scutlern Cotton Oil Co., Goldsboro, N. C.	Secco Ammoniated Compound.	Robersonville.	7.60	1.26	1.56	2.82	3.43	19.44
242	Scutlern Cotton Oil Co., Rocky Mount, N. C.	do.	Enfield.	7.94	1.56	1.40	2.93	3.60	20.37
248	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special Formula, High Grade.	Elizabeth City.	6.95	1.68	1.64	3.32	4.01	20.83
318	Union Guano Co., Winston, N. C.	Union Special 8-4.	Kinston.	8.27	2.70	.28	2.93	3.62	20.73
160	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Ammoniated Compound.	Tabor.	9.19	3.11	.20	3.31	4.02	21.01
2162	do.	V.-C. C. Co.'s Bone and Fish Ammoniated Compound.	Elizabeth City.	7.19	2.84	.62	3.46	4.21	21.72
163	do.	do.	Chadbourn.	7.75	2.07	1.02	3.09	3.76	20.73
2224	Winberne Guano Co., Norfolk, Va.	Special Triumph Guano.	Edenton.	8.10	1.26	2.06	3.32	4.04	2.04
Brands claim ing				8.00			4.11	5.00	25.26
2044	Armur Fertilizer Works, Baltimore, Md.	Armur's Ammoniated Superphosphate.	Elizabeth City.	7.71	2.52	1.42	3.94	4.73	24.26
226	Eastern Cotton Oil Co., Bedford, N. C.	Our Surprise.	Elizabeth City.	8.19	1.16	2.58	3.74	4.55	23.90
254	Jacey, N. B., Guano Co., Tarboro, N. C.	Jacey's 8-5-0 Fish Scrap Guano.	Fayetteville.	8.15	1.96	1.78	3.74	4.55	23.63
2144	Navassa Guano Co., Wilmington, N. C.	Navassa High Grade Ammoniated Superphosphate.	Robersonville.	7.84	3.02	.70	3.72	4.52	23.46
215	Panlico Chemical Co., Washington, N. C.	Panlico Tip-top Potato Guano.	Edenton.	7.92	2.76	1.06	3.82	4.64	23.65
283	do.	do.	Bayboro.	7.80	2.42	1.62	4.04	4.91	24.77
2087	Pecoonoke Guano Co., Norfolk, Va.	Pecoonoke 5-8-0 Fertilizer.	Moyock.	8.20	2.86	1.12	3.93	4.84	24.92
332	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Apollo Special Trucker.	Elizabeth City.	8.13	2.88	1.26	4.14	5.03	25.52
223	Swift & Co., Fertilizer Works, Atlanta, Ga.	Swift's Special Truck Fertilizer, High Grade, 8-5-0.	Elizabeth City.	7.94	1.70	2.18	3.88	4.72	24.24

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphate	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		Potash
Brands claiming									
212	Upton, L. J., & Co., Norfolk, Va.	Upton's Special Fertilizer, Revised 1917	Oriental	8.00	2.80	1.28	4.11	5.00	\$35.25
213	do.	do.	Oriental	7.59	2.76	1.36	4.03	4.96	24.73
279	do.	do.	Rayboro.	7.47	2.78	1.28	4.06	4.94	24.77
223	Va.-Car. Chemical Co., Richmond, Va.	V.-C. 8-5-0 Ammoniated Superphosphate.	Washington	7.37	3.34	.68	4.02	4.89	24.42
Brands claiming									
2086	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Alaska 7 Per Cent Ammoniated	Maple	7.70	3.90	1.78	5.76	7.00	24.53
229	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's for All Crops 8-7 Ammoniated Phosphate.	Elizabeth City	8.00	3.90	1.78	5.63	6.91	32.19
				9.90	4.12	1.74	5.86	7.12	32.11
Brands claiming									
208	Acme Mfg. Co., Wilmington, N. C.	Acme 9-3-0 Special Fertilizer	Maxton	9.00	1.14	1.38	2.47	3.00	19.37
337	American Agricultural Chemical Co., New York, N. Y.	Number One Ammoniated Fertilizer, Vance.	Henderson	8.72	1.78	.70	2.52	3.06	19.30
				8.93	2.32	.38	2.48	3.02	19.35
2156	American Fertilizing Co., Norfolk, Va.	American 9 and 3 Ammoniated Compound.	Dunn	9.73	1.58	.98	2.70	3.28	21.07
2131	do.	do.	Dunn	9.19	1.32	.70	2.56	3.11	19.94
2133	do.	do.	Dunn	11.22	1.74	.74	2.02	2.46	19.70
2158	do.	do.	Dunn	9.13	1.58	.62	2.18	3.02	19.55
2132	do.	do.	Dunn	8.70	1.25	1.00	2.20	2.67	17.94
30	Armour Fertilizer Works, Greensboro, N. C.	Armour's Ammoniated Superphosphate Fertilizer.	Norwood	8.70	1.45	1.00	2.25	2.74	18.15
161	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Nonpotash Mixture.	Chadbourn	9.42	1.81	.70	2.45	2.98	19.71
2078	Berkley Chemical Co., Norfolk, Va.	Berkley 3-9-0 Fertilizer.	Dunn	8.44	1.62	.78	2.54	3.09	19.11
2130	do.	do.	Newton Grove	8.60	1.80	.64	2.40	2.92	18.68
260	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co.'s Fish Mixture.	Parkton	9.52	1.80	.64	2.44	2.97	19.78

2152	Coweta Fertilizer Co., Newnan, Ga.	Coweta 9 and 3 Ammonia Compound	Dunn	8.52	2.02	.70	2.72	3.31	19.91
2129	do.	do.	Dunn	7.82	2.18	.60	2.70	3.23	19.30
263	Craven Chemical Co., New Bern, N. C.	C. C. Co.'s Ammoniated Compound, No. 930.	Fremont	8.82	1.32	.84	2.16	2.63	17.89
2043	Farmers Fertilizer Works, Spartanburg, S. C.	Red Rooster Fertilizer	Red Springs	9.25	1.78	.76	2.54	3.03	19.92
75	Georgia Chemical Works, Augusta, Ga.	Georgia Special Superphosphate	Gibsonville	11.49	2.99	.28	2.57	3.12	21.59
267	Harris Cooperative Co., Wilson, N. C.	Harris' Special Guano	Wilson	8.81	2.12	.78	2.90	3.53	21.99
283	Joscy, N. B., Guano Co., Tarboro, N. C.	Joscy's 9-3-0 Fish Scrap Guano	Fayetteville	8.69	1.28	1.54	2.82	3.43	21.53
2147	do.	do.	Robersonville	8.07	1.66	.94	2.60	3.16	18.93
2149	Martin Fertilizer Co., Norfolk, Va.	Martin's Ammoniated Compound	Dunn	10.02	1.42	.88	2.30	2.80	19.68
2123	do.	do.	Dunn	9.67	1.44	.74	2.18	2.65	18.83
2141	Navassa Guano Co., Wilmington, N. C.	Navassa Standard Ammoniated Superphosphate.	Robersonville	9.24	2.10	.50	2.60	3.16	20.16
310	do.	do.	Vineland	9.40	1.86	.56	2.42	2.94	19.55
2008	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Onslow Crop Grower	Robersonville	8.87	.76	1.82	2.58	3.14	14.71
2169	Pamlico Chemical Co., Washington, N. C.	Pamlico Rank Guano	Elizabeth City	9.03	1.60	.74	2.34	2.84	18.83
313	Peruvian Guano Corporation, Charleston, S. C.	Peruvian Excelsior High Grade Ammoniated Superphosphate.	Fairmont	8.99	1.70	.40	2.10	2.55	17.81
2139	Pocomoke Guano Co., Norfolk, Va.	Pocomoke 3-9-0 Fertilizer	Robersonville	8.71	.64	1.46	2.10	2.55	17.53
332	Richmond, Guano Co., Richmond, Va.	Gilt Edge Guano	Henderson	8.91	1.50	1.08	2.58	3.14	19.75
343	Roberson Mfg. Co., Lumberton, N. C.	R. M. C. 9-3	Fayetteville	8.02	1.52	.92	2.44	2.97	18.27
2019	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Simplex Ammoniated	Jamesville	8.89	1.92	.74	2.66	3.23	20.06
2186	Southern Cotton Oil Co., Fayetteville, N. C.	Secco Ammoniated Compound	Fayetteville	9.42	1.00	2.20	3.20	3.89	22.85
231	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Sweet Potato Fertilizer, Low Grade, 9-3-0.	Elizabeth City	9.95	.72	1.58	2.30	2.80	19.61
307	Union Seed and Fertilizer Co., Wilmington, N. C.	U. S. and F. Co. Brand No. 10	Chadbourn	9.40	1.06	1.08	2.14	2.60	18.39
2029	do.	do.	Marietta	8.99	1.34	.78	2.12	2.53	17.89
331	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's 9-3 Ammoniated Phosphate	Littleton	9.10	1.64	.88	2.52	3.03	19.68
278	Va.-Car. Chemical Co., Richmond, Va.	Blue Ribbon Ammoniated Compound	Kinston	9.63	1.94	.50	2.44	2.97	19.88
275	do.	Morgan's Ammoniated Compound	Emly	8.05	2.36	.48	2.81	3.15	19.98
2083	do.	V.-C. 9-3-0 Ammoniated Superphosphate	Edenton	10.13	1.80	.50	2.30	2.80	19.79
2077	do.	do.	Hope Mills	9.93	1.82	.72	2.54	3.03	20.60
2027	do.	V.-C. C. Co.'s Cotton Ammoniated Compound.	Marietta	10.65	1.90	.41	2.34	2.84	20.48
2058	do.	do.	Windsor	9.71	1.72	.50	2.22	2.71	19.03
159	do.	do.	Tabor	9.92	1.53	.75	2.29	2.78	19.54

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917. MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
2112	Brand claiming Eastern Cotton Oil Co., Hertford, N. C.	Half and Half Cotton-seed Meal and Acid Phosphate.	Columbia	9.00	—	—	2.88	3.50	—	\$21.10
				7.50	.16	2.20	2.36	2.87	—	17.41
2135	Brand claiming Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.	Meal and Fish Mixture No. 1.	Robersonville	9.00	—	—	4.11	5.00	—	26.30
				9.05	1.32	2.50	3.82	4.64	—	25.03
2085	Brand claiming Troutman Mfg. Co., Churchland, N. C.	1916 Troutman's 7 Per Cent T. T. E.	Elizabeth City	9.00	—	—	5.76	7.00	—	33.19
				8.68	3.52	2.16	5.68	6.91	—	32.54
170	Brands claiming Armour Fertilizer Works, Greensboro, N. C.	Armour's Grain Special Fertilizer.	Shelby	10.69	.55	1.14	1.69	2.05	—	17.79
				10.15	.99	.56	1.55	1.88	—	16.65
56	Berkley Chemical Co., Norfolk, Va.	Berkley 2-1-0 Fertilizer	Monroe	10.40	.93	.42	1.35	1.64	—	16.07
145	Georgia Chemical Works, Augusta, Ga.	Georgia Special 10-2-0 Superphosphate	Lexington	10.39	1.16	.50	1.66	2.02	—	17.36
2023	Navassa Guano Co., Wilmington, N. C.	Navassa Ammoniated Superphosphate.	Jamesville	9.75	1.22	.36	1.58	1.92	—	16.39
309	do.	do.	Vineland	10.92	.91	.50	1.41	1.71	—	16.84
28	Norfolk Fertilizer Co., Norfolk, Va.	Oriana 2-1-0 Fertilizer.	Mount Gilead	10.69	.79	.72	1.51	1.84	—	17.03
118	Old Buck Guano Co., Richmond, Va.	Old Buck Ammoniated Phosphate	Siler City	9.00	.11	1.66	1.77	2.15	—	16.43
179	Powhatan Chemical Co., Richmond, Va.	Magic Guano.	Lawndale	10.69	.89	.82	1.71	2.08	—	17.87
87	Royster, F. S., Guano Co., Norfolk, Va.	Columbia Duplex Ammoniated Phosphate.	Burnsville	9.70	.50	1.36	1.86	2.26	—	17.51
2018	do.	Royster's Ovation Brand Ammoniated Union 10-2 Superphosphate.	Jamesville	11.36	.95	.38	1.33	1.62	—	16.95
80	Union Guano Co., Norfolk, Va.	Va.-Car. Chemical Co.'s Ammoniated Compound.	Brown Summit	10.63	.91	.32	1.23	1.50	—	15.80
94	Va.-Car. Chemical Co., Richmond, Va.	do.	Greensboro	10.32	1.18	.38	1.55	1.89	—	16.87
2206	do.	Southern Chemical Co.'s Mammoth Ammoniated Compound.	Mount Airy	—	—	—	—	—	—	—

[illegible]

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	
				10.00					2.00
17	Brands claiming Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Blue Ridge Wheat Grower.	Waynesville	9.52					1.58
40	do.	Southern Chemical Co.'s Mammoth Wheat Grower.	Clyde	9.45					1.31
72	do.	Travers & Co.'s Capitol Fertilizer.	Durham	10.74					1.85
189	Brands claiming Armour Fertilizer Works, Greensboro, N. C.	Armour's Acid and Potash.	Fayetteville	10.00					3.00
191	do.	do.	Fayetteville	10.70					2.92
2203	do.	do.	Mancheater	10.24					2.89
116	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Diamond Wheat Mixture.	Sanford	9.99					2.74
				10.20					2.64
	Brand claiming Va.-Car. Chemical Co., Richmond, Va.	V.-V. C. Co.'s 11-1 Bone and Potash.	Burlington	10.00					1.00
11				13.97					52
119	Brand claiming Cooperative Warehouse Co., Salisbury, N. C.	Farmers' Union 12-0-2 Bone and Potash, High Grade.	Siler City	12.00					2.00
				12.13					1.95
31	Brand claiming Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 14-0-2 Bone and Potash, High Grade.	Albemarle	14.00					2.00
				14.87					1.88

RAW OR UNMIXED FERTILIZER MATERIALS.

92	Brand claiming Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Double Bone Phosphate, Extra Strong.	Hillsboro	13.00					\$11.70
				15.66					14.09

ANALYSES OF COMMERCIAL FERTILIZERS--SPRING SEASON, 1917.
RAW OR UNMIXED FERTILIZER MATERIALS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		Potash
Brands claiming									
2128	Coweta Fertilizer Co., Newnan, Ga.	Coweta, 16 Per Cent Acid Phosphate.	Dunn.	16.06					\$14.40
200	do.	do.	Mount Gilead	16.85					15.16
2128	Craven Chemical Co., New Bern, N. C.	Panama 16 Per Cent Acid Phosphate	Kinston	16.44					14.80
2121	Dunn Oil Mill Co., Dunn, N. C.	16 Per Cent Acid Phosphate.	Dunn.	16.14					14.53
2111	Eastern Cotton Oil Co., Hertford, N. C.	do.	Columbia	17.27					15.54
14	Farm ers Fertilizer Works, Spartanburg, S. C.	Red Rooster Acid Phosphate.	Dillsboro.	15.75					14.17
26	Farm ers Guano Co., Norfolk, Va.	F. G. Co. 16 Per Cent Acid Phosphate.	Mount Gilead	15.96					14.36
2171	do.	do.	Mount Gilead	17.40					15.66
76	Georgia Chemical Works, Augusta, Ga.	High Grade Dissolved Bone Phosphate	South Mills	16.87					15.18
198	do.	do.	Gibsonville	17.27					15.54
2088	Imperial Company, Norfolk, Va.	Imperial 16 Per Cent Acid Phosphate	Wadesboro.	17.27					15.72
8	do.	do.	Currituck	16.95					15.25
4	Navassa Guano Co., Wilmington, N. C.	do.	Burlington	16.01					14.41
173	do.	do.	Graham	17.46					15.71
2246	N. C. Farmers Union, Statesville, N. C.	do.	Forest City	17.41					15.67
2140	Nitrate Agencies Co., Norfolk, Va.	N. C. Farmers Union 16 Per Cent Acid Nitrate Agencies Co. Acid Phosphate	Charlotte	16.09					14.48
27	Norfolk Fertilizer Co., Norfolk, Va.	Oriana 16 Per Cent Acid Phosphate	Robersonville	15.78					14.20
29	Old Buck Guano Co., Richmond, Va.	Old Buck 16 Per Cent Acid Phosphate	Mount Gilead	17.39					15.65
251	Palmetto Guano Corporation, Columbia, S. C.	Old Buck 16 Per Cent Acid Phosphate	Norwood	16.47					14.82
252	do.	Palmetto Acid Phosphate.	Parkton	16.30					14.67
284	Pamlico Chemical Co., Washington, N. C.	do.	Parkton	15.92					11.33
148	do.	Pamlico High Grade Acid Phosphate	Bayboro.	17.10					15.39
2222	Patapsco Guano Co., Baltimore, Md.	do.	Salisbury	16.98					15.28
67	do.	Florida Soluble Phosphate	Snow Hill	17.03					15.33
		do.	Hickory	16.53					14.88

2031	Pearsall & Co., Wilmington, N. C.	Pearsall's High Grade 16 Per Cent Acid Phosphate.	Clarkton.	16.57	14.91
2038	do.	do.	Marietta.	16.32	14.69
2070	do.	do.	Linden.	16.50	14.85
184	do.	do.	Fonville.	14.81	13.33
54	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' 16 Per Cent Acid Phosphate.	Wadesboro.	17.27	15.54
2136	Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.	16 Per Cent Acid Phosphate.	Robersonville.	16.18	14.56
2167	Pocomoke Guano Co., Norfolk, Va.	Superb Acid Phosphate.	Elizabeth City.	16.19	14.57
180	Powhatan Chemical Co., Richmond, Va.	Magie Dissolved Bone.	Lawndale.	16.83	15.15
63	Rasin-Monumental Co., Baltimore, Md.	Rasin's 16 Per Cent Acid Phosphate.	Lincolnton.	16.71	15.04
141	do.	do.	Lincolnton.	17.50	15.75
152	Read Phosphate Co., Nashville, Tenn.	Read's Special High Grade Acid Phosphate.	Murphy.	15.98	14.38
135	Richmond Guano Co., Richmond, Va.	Rex Dissolved Bone.	Concord.	17.04	15.34
133	Robertson Fertilizer Co., Norfolk, Va.	High Peak Acid Phosphate.	No. Wilkesboro.	16.10	14.49
2166	do.	do.	Elizabeth City.	16.00	14.40
85	Royster, F. S., Guano Co., Norfolk, Va.	Columbia High Grade 16 Per Cent Acid Phosphate.	Tocane.	16.85	15.16
207	do.	do.	Jamesville.	16.02	14.42
32	do.	Royster's High Grade 16 Per Cent Acid Phosphate.	Waynesville.	16.76	15.08
353	do.	do.	Elizabeth City.	16.64	14.98
344	do.	do.	Fayetteville.	16.22	14.69
2113	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special High Grade Acid Phosphate.	Garner.	17.12	15.41
294	do.	do.	Elizabeth City.	16.07	14.46
48	do.	do.	Stony Point.	15.93	14.34
153	do.	do.	Murphy.	18.04	16.24
147	Tennessee Chemical Co., Greensboro, N. C.	Ox Tennessee High Grade Acid Phosphate.	Thomasville.	16.68	14.99
146	Tidewater Guano Co., Norfolk, Va.	Top Rail Acid Phosphate.	Lexington.	16.49	14.84
51	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid Phosphate.	Mocksville.	16.24	14.62
70	Union Guano Co., Winston, N. C.	Union 16 Per Cent Acid Phosphate.	Lenoir.	17.30	15.57
2185	do.	do.	Fayetteville.	17.28	15.52
126	do.	do.	Elkin.	16.77	15.09
18	Va.-Car. Chemical Co., Richmond, Va.	Atlantic-Virginia Fertilizer Co.'s Eureka.	Asheville.	16.31	14.68
155	do.	Davie & Whittle's Owl Brand High Grade.	Andrews.	16.55	14.89

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

RAW OR UNMIXED FERTILIZER MATERIALS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		Total Potash
Brands claiming									
71	Va-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Comet 16 Per Cent Acid Phosphate.	Lenoir	16.00					\$14.40
117	do.	do.		17.56					15.80
41	do.	Travers & Co. Clampton Acid Phosphate.	Pittsboro.	16.84					15.16
12	do.	V.-C. C. Co.'s 16 Per Cent Acid Phosphate.	Clyde	16.43					14.79
	do.	phate.	Franklin	17.17					15.45
128	Va-Car. Chemical Co., Richmond, Va.	Virginia State Fertilizer Co.'s Bull Run Acid Phosphate.	Elkin	16.77					15.09
101	Venable Fertilizer Co., Richmond, Va.	Venable's Best Acid Phosphate.	Ruffin	16.72					15.05
Brands claiming									
2228	Farmers Guano Co., Norfolk, Va.	Ground Fish.	Edenton				8.22	10.00	32.88
217	Foreign Products Co., Baltimore, Md.	Fish Guano.	Edenton				7.68	9.34	30.72
257	do.	do.	Parkton				8.02	9.75	32.08
258	do.	do.	Parkton				7.70	9.36	30.80
2125	Imperial Company (The), Norfolk, Va.	Dry Ground Fish.	Dunn				7.24	8.08	28.96
512	Nitrate Agencies Co., New York, N. Y.	N. A. C. Brand Ground Dried Fish.	Whitakers				8.28	10.07	33.12
2197	do.	N. A. C. Brand Ground High Grade Tankage.	Manchester				7.32	8.90	29.28
2014	Pearsall & Co., Wilmington, N. C.	Fish Scrap.	Mount Olive				8.68	10.55	34.72
2082	Winborne Guano Co., Norfolk, Va.	Ground Fish Tankage.	Edenton				7.54	9.17	30.16
Brands claiming									
2016	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Kanona Tankage.	Mount Olive				9.04	11.00	36.16
							9.32	11.33	37.28
2015	Farmers Guano Co., Raleigh, N. C.	do.	Mount Olive				8.68	10.55	34.72
2116	Hardison & Hardison Co., Wadesboro, N. C.	Ground High Grade Fertilizer.	Lilesville				7.82	9.51	31.28

2234	Royster, F. S., Guano Co., Norfolk, Va..... Brand claiming	Royster's Tankage.....	Fayetteville.....	9.74 11.84.....	38.96.....
	Armour Fertilizer Works, Wilmington, N. C..... Brand claiming	Dried Blood.....		13 16 16 00.....	52.64.....
192	Old Buck Guano Co., Richmond, Va..... Brand claiming	Nitrate of Soda.....	Ahoskie.....	13 06 15 88.....	52.24.....
2265	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Nitrate of Soda.....	Fayetteville.....	15.22 18 50.....	60.88.....
2194				15.36 18 67.....	61.40.....
				15 63 19 00.....	62.52.....
				15 00 18 24.....	60 00.....

The above analyses were made up to May 1, 1917.

B. W. KILGORE, *State Chemist.*

LEAF TOBACCO REPORTS

NOVEMBER, 1916.

Pounds sold for producer.....	32,473,036
Pounds sold for dealers	1,355,795
Pounds sold for warehouses.....	1,978,289
Total	35,807,120

DECEMBER, 1916.

Pounds sold for producer	14,371,519
Pounds sold for dealers	626,887
Pounds sold for warehouses.....	1,160,357
Total	16,158,763

JANUARY, 1917.

Pounds sold for producer.....	7,174,653
Pounds sold for dealers	395,521
Pounds sold for warehouses.....	519,887
Total	8,090,061

FEBRUARY, 1917.

Pounds sold for producer	2,606,327
Pounds sold for dealers.....	168,598
Pounds sold for warehouses.....	318,523
Total	3,093,448

MARCH, 1917.

Pounds sold for producer.....	382,615
Pounds sold for dealers.....	46,878
Pounds sold for warehouses.....	25,120
Total	454,613

APRIL, 1917.

Pounds sold for producer.....	17,782
Pounds sold for dealers.....	1,608
Pounds sold for warehouses.....	30
Total	19,420

THE BULLETIN
OF THE
NORTH CAROLINA
DEPARTMENT OF AGRICULTURE
RALEIGH

Vcl. 38, No. 6 JUNE, 1917 Whole No. 233

COUNTY SOIL REPORT No. 2

REPORT ON
GASTON COUNTY SOILS AND AGRICULTURE



MAP OF NORTH CAROLINA SHOWING SOIL SURVEY AREA OF GASTON COUNTY

This work was done by the Division of Agronomy of the State Department of Agriculture in coöperation with the Bureau of Soils of the Federal Department of Agriculture.

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

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1917

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*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In coöperation with Bureau of Plant Industry, United States Department of Agriculture.

LETTER OF TRANSMITTAL

WEST RALEIGH, N. C., May 18, 1917.

SIR:—Herewith I transmit a *Report on the Soils and Agriculture of Gaston County*. The data on the soils included in the report were gathered in a systematic soil survey of the county made in 1909 in coöperation with the Bureau of Soils of the United States Department of Agriculture.

In the recommendations with reference to the soils and their plant-food requirements, we have been largely guided by the results secured in carefully conducted soil-type field experiments in Gaston and adjoining counties.

I would recommend that this report be issued as County Report No. 2.

Respectfully submitted,

C. B. WILLIAMS,

Chief, Division of Agronomy.

Approved:

W. A. GRAHAM,

Commissioner of Agriculture.

REPORT ON GASTON COUNTY SOILS AND AGRICULTURE

BY C. B. WILLIAMS, W. E. HEARN, J. K. PLUMMER, AND W. F. PATE

Gaston County lies in the southwestern part of the State, bordering the South Carolina line. It is bounded on the north by Lincoln County, on the east by Mecklenburg County, on the south by South Carolina, and on the west by Cleveland County. The county is $17\frac{1}{2}$ miles long north and south, with an average width of about 20 miles, east and west. It contains about 370 square miles, or 236,800 acres.



FIG. 1.—Showing the gently rolling nature of the section of the State of which this county is a part.

The general surface of the county consists of gently rolling, rolling to hilly or broken and even mountainous areas. There are many broad, level to gently rolling to rolling areas around Gastonia, Dallas, Antioch Church, Cherryville, Alexis, Lucia, Belmont, and Union Church. The hilly and broken areas are developed along the rivers and larger streams.

In elevation above the sea-level the county ranges from about 600 to 1,100 feet, being near 1,100 feet at the town of Kings Mountain, about 1,000 feet at Cherryville, and around 900 feet at Bessemer City. Of course, the knolls and mountains rise much higher, and Pinnacle Moun-

tain attains a height of 1,705 feet, and Crowders Mountain 1,624 feet. The prevailing slope of the county is to the southeast and south, following the principal drainageways.

All of the county, with the exception of small strips of bottomland, has excellent natural surface drainage through the rivers, creeks, and branches, together with the numerous spring branches and wet-weather streams which ramify all parts of the upland.



FIG. 2.—Showing the character of the forest growth.

Along South Fork and Catawba rivers there is much fall, and in many places considerable water-power has been developed for running cotton mills. Much power still remains undeveloped. Some of the larger creeks furnish power for gristmills and cotton gins, and even on these streams some power can be obtained.

The transportation facilities of the county are excellent. The main line of the Southern Railway, a branch of the Seaboard Air Line Railway, the Carolina and Northern Railway, and also the electric line of

the Piedmont Northern traverse Gaston County. No farm in the county is more than 8 miles from a railroad. Macadam and good dirt roads are distributed over the county. Electricity generated on the edge of the South Carolina line is transmitted to all parts for use in running cotton mills and other manufactories.

There is a larger number of towns and cotton mills in Gaston County than in any other county in North Carolina. Gastonia, the commercial center and county-seat, is the largest town. Dallas, Cherryville, Kings Mountain, Mount Holly, Stanley, Bessemer City, Lowell, and McAdenville are thrifty towns, while High Shoals, Hardins, Tuckaseegee, Philipsburg, Mayesworth, and Spencer Mountain each have one or more cotton mills. All of the towns furnish excellent markets for the products of the county at fairly good prices.

AGRICULTURAL STATISTICS

The value of farm property in Gaston County at the last census period was over 8,600,000. This was an increase of 165 per cent over the previous census. Of the farm property values of the county, it is distributed as follows:

	<i>Per Cent.</i>
Land	66.7
Buildings	21.5
Implements and machinery	2.9
Domestic animals	9.0

Eighty-four and two tenths per cent of the land area is in farms. Fifty and nine tenths per cent of the farm land is improved. The average size of the farms of the county is 69.9 acres. The population of the county in 1910 was 37,063.

CLIMATE

There is no established Weather Bureau Station in Gaston County, but the accompanying table, compiled from the records of the station located at Charlotte, will represent fairly well the local conditions.

This table shows a mean annual rainfall of 49 inches and a mean annual temperature of 60° F., which gives a mild and equable climate for this region. The average annual snowfall is slightly above 7 inches. The rainfall is well distributed throughout the year. During the fall months the precipitation is usually slightly less, giving a favorable season for the ripening and opening of cotton, and also for harvesting both cotton and corn.

In such a climate considerable farm work can be carried on during much of the winter. There is a comparatively long growing season between the last killing frost in the spring and the first in the fall.

Occasionally the seasons are somewhat uncertain and full crops are not always secured, but there is never a crop failure.

The county has a splendid health record, as the surface is high and rolling and thoroughly drained. Good water from either wells or springs can be had in all parts of the county.

NORMAL MONTHLY, SEASONAL, AND ANNUAL TEMPERATURE AND PRECIPITATION
AT CHARLOTTE, MECKLENBURG COUNTY.

Month	Temperature			Precipitation			
	Mean	Absolute Maximum	Absolute Minimum	Mean	Total Amount for the Driest Year	Total Amount for the Wettest Year	Snow, Average Depth
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
December.....	43	76	—5	3.8	1.9	5.7	2.2
January.....	41	77	—1	4.3	2.3	7.6	1.9
February.....	44	79	—5	4.6	5.4	6.4	2.9
Winter.....	43			12.7	9.6	19.7	7.0
March.....	51	85	14	4.8	1.6	9.2	0.6
April.....	59	94	26	3.4	1.9	5.4	0.1
May.....	69	97	38	3.9	1.7	4.8	0.0
Spring.....	60			12.1	5.2	19.4	0.7
June.....	76	102	45	4.6	3.4	9.5	0.0
July.....	79	102	55	5.3	6.4	7.9	0.0
August.....	77	100	53	5.2	1.0	2.1	0.0
Summer.....	77			15.1	10.8	19.5	0.0
September.....	72	99	38	3.3	4.7	3.6	0.0
October.....	61	92	20	3.4	1.0	1.5	Trace
November.....	51	80	18	3.0	3.7	4.7	Trace
Fall.....	61			9.7	9.4	9.8	Trace
Year.....	60	102	—5	49.6	35.0	63.4	7.7

SOILS

One of the important things concerning soils is how the various types or classes of land have been formed. In Gaston County, which lies in the Piedmont region of the State, all of the upland soils are nothing more than broken or decayed rock fragments with the addition of organic matter. The more common rocks underlying the soils here are granites, gneisses, and schists. These rocks are usually light gray and vary from fine to coarse grained. The granite is particularly noticeable around Gastonia, Dallas, Hardins, High Shoals, northeast of McAdenville, near Union Church, and between Dallas and Bessemer City. Around Cherryville and to the west of Mountain Island a very coarse green granite and, in some places, gneiss occur. The weathering of these coarse granites and gneisses has given rise to the Durham coarse sandy loam and the

Cecil coarse sandy loam. It appears that the rocks giving rise to the Durham coarse sandy loam have a smaller amount of iron or the degree of oxidation has been less, and as a result a yellow clay is formed instead of the red clay of the Cecil types.

The Cecil sandy loam, Cecil fine sandy loam and stony loam are derived from the granites and gneiss medium to fine in texture. The Cecil loam comes principally from mica schist or talcose schist and felsite.

The Cecil clay loam is derived principally from the fine textured rocks and also from the medium or coarser textured rocks and through heavy erosion of the sandy material derived from these rocks. As an example of this erosion, if the greater part of the sandy material from the sandy loams were removed, it would result in the formation of the clay loam type.

The Cecil clay or "heavy red land" comes from the weathering of the dark colored rocks such as hornblende schist and diabase. Shiny particles of the minerals contained in these rocks are seen in ditches and gullies throughout these formations.

The Iredell clay loam owes its origin to the weathering of dark green or dull colored to almost black rocks sometimes called "niggerhead" rocks.

The mountains, knolls, and peaks in the county owe their existence to the fact that they are composed of exceptionally hard rocks called quartzite. Such rocks have withstood the forces of weathering while the softer rocks have weathered down and the material has been transported, thus leaving a lower region.

White quartz, gravel, and rock fragments are present on the surface in many places; but with the exception of the stony loam type, the presence of these do not interfere seriously with cultivation.

The level areas or first bottom-lands along the rivers and creeks, mapped as Congaree fine sandy loam and Meadow, were formed by the streams.

Soils similar to these in Gaston County were first mapped in Cecil County, Maryland, and the series name is due to that fact.

The following table gives the name and extent of the soil types mapped in Gaston County:

AREAS OF DIFFERENT SOILS.

Soil	Acres	Per Cent	Soil	Acres	Per Cent
Cecil sandy loam.....	66,112	27.9	Durham coarse sandy loam..	4,430	1.9
Cecil clay loam.....	65,216	27.5	Iredell clay loam.....	4,288	1.8
Cecil fine sandy loam.....	32,768	13.8	Congaree fine sandy loam..	4,169	1.8
Cecil loam.....	20,160	8.5	Cecil stony loam.....	3,904	1.7
Cecil coarse sandy loam....	12,693	5.3	Rock outcrop.....	704	.3
Meadow.....	12,032	5.1			
Cecil clay.....	10,368	4.4	Total.....	236,800	



FIG. 3.—A typical farm scene of the section.



FIG. 4.—Roads of this type have been constructed to a considerable extent in the county.

CECIL SANDY LOAM

This soil is locally known as "gray land," with red clay subsoils. It covers 66,112 acres, or nearly 28 per cent of the county, and is the largest type in extent. It extends in a wide, almost unbroken belt north through the central part of the county, including most of Gaston Township. It is well developed around Gastonia, Dallas, Hardins, in the vicinity of Long Creek Church, Snapp, Sellers Store, to the north of Cherryville, around Lucia and in the River Bend section of the county.

The greater part of this surface soil consists of a light gray to light brown loose mellow sandy loam. Frequently, below 6 inches the material is a yellowish or reddish-yellow loam. The subsoil begins anywhere between 6 and 15 inches, and is a red stiff clay. There is considerable variation in this type; for instance, the soil is heavier and shallower bordering the clay loam and clay soils. In the vicinity of Union Church and to the south occurs a deeper sandy soil which has a reddish-yellow clay subsoil. As a rule, the deeper and more sandy spots are less productive than the true brown surface soil areas. Spots of brown gravelly loam are seen here and there and also in a few places a coarser surface soil with bedrock 2 or 3 feet from the surface. The larger gravelly areas have been indicated on the soil map by small circles.

The surface of this soil is gently rolling to rolling, becoming rough and broken as the streams are approached. The broadest areas occupy a beautiful position for general farming purposes. It is admirably drained; in fact, the hillsides and steeper slopes should in places be terraced to prevent washing. It has a mellow loose structure and is the most easily tilled soil in the county, and all kinds of improved machinery can be used over a large part of it. It absorbs rain water rapidly and the clay subsoil retains it well. The heavier and more typical areas of this soil are best suited to the production of cotton, corn, and cowpeas, while the more sandy areas are suited to truck crops, sweet potatoes, peanuts, melons, and rye.

Cotton yields from $\frac{1}{3}$ to 1 bale per acre; corn from 10 to 15 bushels ordinarily, but as high as 100 or more bushels per acre have been obtained; cowpea hay, $\frac{3}{4}$ to $1\frac{1}{2}$ tons per acre; while the yield of wheat and oats is generally low. Sweet potatoes produce from 75 to 300 bushels per acre. Sorghum cane yields well, while peanuts, vegetables, and fruits suitable to the climate give fair returns.

For the improvement of this soil it is recommended that green manuring crops or barnyard manure be turned under to supply the needed organic matter and nitrogen. Deeper plowing and better cultivation will give increased yields.

The following gives the average results of analyses of soil and subsoil of Cecil sandy loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.037	.0353	3.159	.1041	727	693	62105	2046
Subsoil }	.025	.0321	1.798	.0693	1978	6196	142253	5523

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil....	3.9	21.2	13.9	27.3	15.4	13.5	4.8
Subsoil.....	2.4	9.2	4.4	9.3	6.8	28.2	39.6

CECIL CLAY LOAM

The Cecil clay loam is one of the largest and most important soil types in the county. It ranks next in size to the sandy loam, covering as it does 65,216 acres, or 27 per cent of the county. It is one of the important soils of the Piedmont plateau. It is generally recognized as the "red land" or "mulatto land," and spots of it are called "push land." In many places it closely approaches the red clay, but differs from this in that the surface is a brown to red loam or clay loam carrying more sand and being of a more mellow structure than the heavy red clay. The subsoil is a bright red stiff clay, hard when dry and plastic when wet, and usually has some white sand or quartz rock in the form of veins. The spots of dull brown loam having a depth of 10 to 15 inches are called "push land" or "dead land" because the soil does not slide easily from the plow. The Cecil clay loam occurs in all parts of the county, but its greatest development is found in the southeastern part between the Catawba and South Fork rivers. Other large areas are mapped in River Bend Township, through Dallas Township, and from Concord Church north to Webb Chapel.

In surface features this soil is similar to the associated upland soils; that is, it has smooth gently rolling to rolling areas on the divides and steep hilly to broken areas near many of the streams. South of Belmont lies a comparatively smooth ridge, but the slopes are hilly and broken. Some of the roughest topography of this soil is seen to the west of Stanley, south of Hardins, and generally along the rivers and larger creeks. Rain water runs off of the surface rapidly and in many places gullies

and deep ravines are formed. Terracing is essential in order to prevent a too great wasting away of the soil by erosion.

While this is a rather heavy soil, yet it is easier to obtain a good tilth than upon clay, due to the fact that the sand present in this clay loam renders it more friable and easier to handle. In crop adaptation it is similar to the clay, being suited to the production of corn, oats, wheat, clover, and cotton. However, the cotton grown on this soil should be an early maturing variety, as it does not open as early as upon sandy soil. Corn yields from 12 to about 160 bushels per acre, averaging about 20 or 25 bushels; wheat from 10 to 25 to 60, cowpeas 1 to 2 tons of hay, and cotton from $\frac{1}{3}$ to 1 bale per acre. All of the larger yields depend upon the methods employed and the amount of fertilizer or manure applied.

Deeper plowing, better preparation of the land, and more frequent cultivation, together with the turning under of cowpeas and coarse manures, are recommended for the improvement of this soil. It is naturally one of the strongest soils of the county and one capable of being improved to a high state and easily maintained.

The following table gives the average results of analyses of soil and subsoil of Cecil clay loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of $6\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P_2O_5)	Potash (K_2O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P_2O_5)	Potash (K_2O)	Lime (CaO)
Surface } 2mm. {	.063	.033	.493	.11	1212	588	8785	1960
Subsoil }	.024	.075	.335	.081	1920	6000	26800	6480

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	0.5	2.0	2.5	10.7	20.4	27.0	36.7
Subsoil.....	0.2	0.4	0.5	2.0	3.2	37.2	56.4

CECIL FINE SANDY LOAM

This type occurs in large areas around Stanley, Alexis, southwest of Spencer Mountain, north of Dallas, around Bessemer City and Kings Mountain, south of Trinity Church, and in the extreme northwest corner of the county. It covers 32,768 acres, or nearly one-seventh of the county.



FIG. 5.—Experimental wheat grown on Cecil Sandy Loam Soil on the farm of C. M. Faires of this county during 1911. The part on the left was fertilized with a mixture containing nitrogen and phosphoric acid, and the part on the right with nitrogen and potash. The wheat on the left produced almost double that on the right.



FIG. 6.—This grass mixture will do well on the soils of the county if properly put in and fertilized.

The surface soil ranges in depth from about 5 to 12 inches and consists of a gray to light brown mellow fine sandy loam. It is underlain by a red tough clay.

This type is developed on the gently rolling to rolling areas, becoming broken and hilly near the streams. It is found on some of the highest elevations not included by the mountains and possesses good natural surface drainage.

In general this soil is similar to the sandy loam except being finer in texture and is used for practically the same crops. The recommendations suggested for the improvement and handling of the Cecil sandy loam will apply equally well to this type.

The following table gives the average results of analyses of the soil and subsoil of Cecil fine sandy loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre, Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.042	.015	.901	.196	741	271	16290	3544
Subsoil }	.021	.061	.796	.069	1636	4753	62024	5376

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.0	2.4	3.5	29.5	32.4	23.3	7.7
Subsoil.....	0.2	0.7	1.1	7.8	9.8	24.9	55.5

CECIL LOAM

This soil occurs in large areas in the southwestern part of the county in Crowders Mountain Township. It begins at Unity Church on the South Carolina line, continues north by Philipsburg and Bessemer City, and thence northeast on either side of Pasonr Mountain and to the west of High Shoals. Another large body lies north of Stanley and a smaller body is found between Gastonia and Lowell. In all, the type covers practically 20,000 acres.

The surface soil consists of a mellow smooth loam of yellowish-grayish or light brown color. In places the surface is almost white. A few gravel or rock fragments are mixed with the soil in some places. The red clay subsoil is generally friable, but in places it is tough and very

compact and the underlying rocks locally come within two or three feet of the surface. It occupies comparatively smooth surface areas, varying from gently rolling to rolling, with a few steep slopes, and possesses good natural surface drainage.

Some of the original growth of white, post, and red oak, hickory and pine, valuable for merchantable timber, was seen near High Shoals and to the north and west of Pasour Mountain.

The brown surface soils of this type are more productive than the light gray or whitish areas. While most of the soil is fairly easy to till, yet it is more difficult than the sandy loams and easier than the red clays. It should be plowed under proper moisture conditions in order to avoid clodding and baking.

Cotton, corn, and cowpeas are the principal crops, while apples, pears, and peaches give fair returns on some of the ridges. The recommendations suggested for the improvement of the sandy loam types will hold equally well for this soil.

The following table gives the average results of analyses of soil and subsoil of Cecil loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.03	.63	.985	.141	590	590	19384	2775
Subsoil }	.016	.0371	2.31	.032	1280	4563	184800	6560

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.3	2.9	2.7	10.4	21.8	46.7	14.1
Subsoil.....	.4	1.4	1.3	4.5	8.4	40.8	43.2

CECIL COARSE SANDY LOAM

There are about 12,000 acres of the Cecil coarse sandy loam type in the county. This soil differs from the sandy loam in that it has a considerable quantity of fine gravel and coarse sand and occasionally rock fragments in the surface soil. The subsoil is red clay, but the coarse sand particles present render it slightly more crumbly than the subsoil of the heavier types. This land is closely related in many places to the

Durham coarse sandy loam, and where the two soils join it is underlain by a reddish-yellow clay.

Most of this soil occurs in the vicinity of Cherryville, where it covers a large area. About two square miles of the type lie between McAden-ville and Goshen Church, and another heavy body lies north of Penley Chapel along the Cleveland county line.

The surface is gently rolling to rolling, becoming rough and broken near the streams. It comprises the most elevated farming land in the county, lying between 950 and 1,000 feet above the sea-level. All of it is well drained, excessively so with the steeper slopes, as is evidenced by the amount of erosion and washing.

Some of the original timber growth of oak and pine still stands, but most of this soil has been cleared and cultivated. Cotton, corn, and cow-peas are the principal crops. Some wheat is grown in recent years, and also sweet potatoes, Irish potatoes, and peanuts. This soil can be handled and improved in the same way as the Cecil sandy loam.

The following table gives the average results of analyses of soil and subsoil of Cecil coarse sandy loam:

CHEMICAL ANALYSIS.

		Percentage Composition				Pounds of Total Plant Food Con- stituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
		Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	} 2mm. {	.054	.029	1.79	.070	928	472	29772	1226
Subsoil		.020	.062	1.51	.082	1504	4616	112207	6152

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	15.5	19.9	7.2	13.3	6.8	27.4	9.9
Subsoil.....	6.0	6.9	2.3	4.2	1.9	23.9	54.7

CECIL CLAY

Soil of the Cecil clay class is familiarly known as "the heavy red clay land," being heavier and redder than the clay loam type. Its principal occurrence lies to the north of Belmont, around St. Mary's College, along the Seaboard Air Line Railway, west of Nims, and to the south and east of Webb's Chapel, north of Concord Church, and in many other spots scattered over the county. There are about 10,000 acres of the Cecil clay in Gaston County.

The soil is a deep red to reddish-brown clay or clay loam grading into a deep red, heavy, tough and fairly brittle clay. It is sticky when wet and becomes hard upon drying out. It possesses the smallest content of sand and gritty material of any type in the county, and this accounts for the close structure.

Its surface is gently rolling to rolling, with here and there a few steep slopes. The rain water usually runs off rapidly and gullies are easily formed; particularly is this true of the fields which have been plowed shallow and have no cover crops.

This red clay comes from the weathering of dark colored rocks high in iron and elements of plant food. It is naturally one of the strongest soils in the region and one particularly suited to the growing of wheat, clover, oats, corn, grasses, and alfalfa.

Around Rock Hill, South Carolina, a soil similar to this is used for the profitable production of alfalfa, and there is every reason to believe that this crop could be grown advantageously on this soil in Gaston County. It is the best wheat, clover, and oat land in the Piedmont plateau.

The soil should be plowed deeper and be more thoroughly pulverized so that it will absorb more rain water and retain it for the use of plants during dry periods. Any kind of coarse manures or green manuring crops will be beneficial toward loosening up the soil and at the same time supplying the needed nitrogen, thus greatly increasing the yields. This soil requires heavy farm machinery and strong work stock to bring it to its highest efficiency in crop production.

The following table gives the average results of analyses of soil and subsoil of Cecil clay:

CHEMICAL ANALYSIS.

		Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,060,000 Lbs.			
		Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	} 2mm. {	.0910	.085	.637	.178	1769	1652	12380	3459
Subsoil		.0333	.106	.523	.10	2704	8480	41840	8000

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	3.4	10.1	8.9	20.8	8.4	20.0	28.5
Subsoil.....	0.9	5.3	4.0	9.8	5.6	17.6	56.7



FIG. 7.—Modern barn, built on the Farm-Life School Grounds at Dallas.



FIG. 8.—Type of improved sand-clay roads that are being built in the county.

DURHAM COARSE SANDY LOAM

This is the whitish coarse sandy or gravelly land of the county. It occurs in the northwestern part east of Cherryville and to the north of Shady Grove Church; also to the south and northeast of Mountain Island.

It is distinguished from the other soils of the county by having a whitish to light gray surface soil of a coarse loose sandy loam carrying fine white gravel. The subsoil is a yellow sandy clay to friable clay and has mixed with it coarse sand particles. The soil is open, mellow, and very easy to cultivate. The whitish color of the surface soil indicates that it contains a very small amount of vegetable matter, and one naturally thinks of it as being poorer or less productive than the surrounding soils.

The surface of this type varies from gently rolling to rolling and hilly. Owing to the open structure of the soil and the high position it occupies, it has excellent natural drainage throughout. It warms up early in the spring and can be tilled immediately after rains. In Durham, Caswell, Granville, and other counties this soil is especially adapted to the production of bright tobacco. It is a splendid soil for truck crops, sweet potatoes, and rye. Peanuts can be grown profitably. Corn and cotton are the main crops produced in Gaston County, and the yields of these are generally lower than upon the Cecil soils. The incorporation of vegetable matter through manuring crops and by the addition of barnyard manure is highly recommended for the improvement of this soil.

The following gives the average results of analyses of soil and subsoil of Durham coarse sandy loam:

CHEMICAL ANALYSIS.

Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{3}{4}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.0385	.0215	.471	.110	641	358	7842
Subsoil }	.627	.019	.540	.161	1939	1364	38772

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	13.5	23.5	8.9	14.9	6.1	20.1	12.9
Subsoil.....	9.0	9.7	3.9	5.8	3.0	15.7	52.6

CECIL STONY LOAM

This soil is unimportant agriculturally and represents the roughest surface areas in the county. Bodies of this soil are found on Pinnacle, Crowders, Pasour, Spencer Mountain, Jackson Knob, and Berry mountains. In addition to occupying the rough mountainous topography, the soil is filled with white quartz and other rock fragments which interferes with cultivation. Some of the smoother surface portions might be used for apples or pasturage purposes, while the rougher areas should remain forested. It is the lowest priced land in the county.

The following table gives the average results of analyses of soil and subsoil of Cecil stony loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2mm. {	.063	.04	1.505	.121	1628	653	24562	1975
Subsoil }	.02	.076	1.626	.254	1600	6930	130080	20320

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....							
Subsoil.....							

CONGAREE FINE SANDY LOAM

Along the Catawba and South Fork rivers are narrow strips of bottom-land varying from a few yards to one-fourth mile in width. The soil consists of brown fine sand, silt, and clay which has been washed from the uplands, brought down and deposited by the streams. It is a fine sandy loam of a mellow loose structure and is very easy to till. Small shiny particles of mica or isinglass are conspicuous in this soil.

The surface is nearly flat, with here and there a few narrow bands of fine sand in the form of low ridges. Drainage is usually good, but all of the soil is subject to overflow during high freshets. Most of this soil was under cultivation prior to the floods of 1916, at which time much of this land was completely changed by deposition or removal of material, leaving some of the formerly good bottoms practically worthless. It produces good yields of corn, rye, and watermelons. Some of the largest watermelons in the State are grown on this soil. Corn yields from 15 to 40 bushels per acre.

IREDELL CLAY LOAM

This soil is locally known as "Blackjack oak land" or "pipe clay land." There is only a small acreage of it in the county, and this lies in the eastern part of the county and to the north of Mount Holly, and about two miles east of Stanley. It is readily recognized by the forest growth of blackjack oaks and other oaks and by the peculiar character of the subsoil and also the presence of "nigger-head" rocks on the surface.

The surface soil is a dull brown or dark gray loam, and this changes abruptly into a yellowish-brown waxy, sticky, or putty-like clay which grades into the rotten greenish-yellow colored rocks at 2 or 3 feet. Small rounded brown iron pebbles about the size of ordinary peas are present on the surface.

It occupies gentle slopes to rolling areas, having good drainage over the surface portion, but the underdrainage is very poor owing to the density of the clay subsoil, which hinders the movement of water in either direction. The soil is suited to corn, cotton, oats, and wheat, and also for pasturage purposes, especially when seeded to Johnson grass.

The following table gives the average results of analyses of the soil and subsoil of the Iredell clay loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P₂O₅)	Potash (K₂O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P₂O₅)	Potash (K₂O)	Lime (CaO)
Surface } 2mm. {	.061	.042	.176	3.29	1016	700	2932	54811
Subsoil }	.0516	.099	.1055	2.661	3988	7651	8153	205642

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	6.7	8.2	5.0	16.0	26.9	26.4	10.4
Subsoil.....	2.9	3.8	3.0	7.0	11.8	31.2	40.1

MEADOW

The land mapped as Meadow is found in the first bottoms along practically all of the streams. Much of the soil is productive and gives large yields of corn and native grass without fertilization. The meadow land where cleared furnishes excellent summer pasturage for cattle.

The meadow represents the cream of the upland soils, in that the clay, silt, and fine sand have been washed from them and deposited along the streams. The rain water running from the hillsides carries this material in suspension. All grades of material and textures of soils are found, varying from the light-brown sands to heavy red clays.

Some of the largest bodies of meadow land are developed along Long, Crowders, and Dutchmans creeks, and here most of the soil is a brown rich loam. All of it is subject to frequent overflow and change by stream currents. Much of it is poorly drained, but when drained and reclaimed by deepening and straightening the stream channels and ditching, some of the most fertile land of the county will be restored to a condition suitable for successful and profitable crop usages.

ROCK OUTCROP

Bare rock walls and rough stony areas have been classed as Rock Outcrop. Such a condition exists on the crests and sides of the mountains and higher knobs. It has no agricultural value.

PLANT FOOD IN SOILS OF THE COUNTY

The chemical examination of the soils of this county has shown in a general way that lime, phosphoric acid, and nitrogen are the constituents that are contained in smallest amounts. This, too, has generally been the findings with reference to most soils examined in other portions of the Piedmont section of the State.

The soils showing the largest amounts of nitrogen are Cecil Clay, Cecil Clay Loam, Cecil Stony Loam, Iredell Clay Loam, and Cecil Coarse Sandy Loam. Those showing the smallest amounts of this constituent at the present time are Cecil Loam, Cecil Sandy Loam, Durham Coarse Sandy Loam, and Cecil Fine Sandy Loam.

Phosphoric acid is relatively low in all of the soils of the county. It is found to be highest in Cecil Clay, Iredell Clay Loam, Cecil Stony Loam, Cecil Sandy Loam, and Cecil Clay Loam, the lowest in Cecil Fine Sandy Loam, Durham Coarse Sandy Loam, Cecil Coarse Sandy Loam, and Cecil Loam in the order given.

In potash content the soils of this county, as of other counties of the Piedmont Region of the State, are relatively high as compared with most of the soils of the Coastal Plain Region. Those containing this constituent in the highest amount are the Cecil Sandy Loam, Cecil Coarse Sandy Loam, Cecil Stony Loam, Cecil Loam, and Cecil Fine Sandy Loam. Those having smallest amounts of this constituent are soils of the Iredell Clay Loam, Durham Coarse Sandy Loam, Cecil Clay Loam, and Cecil Clay type of soil, in the order given.

In lime content, the Iredell Clay Loam is much higher than any of the other soils occurring in the county, it containing more than 3 per cent of this constituent, while the others contain less than 0.2 per cent. In

addition to the Iredell Clay Loam, the other soils containing the largest amounts of this constituent are Cecil Fine Sandy Loam, Cecil Clay, Cecil Loam, and Cecil Stony Loam. These lowest in total lime content are Cecil Coarse Sandy Loam, Cecil Sandy Loam, Cecil Clay Loam, and Durham Coarse Sandy Loam.

WHAT OUR EXPERIMENTS HAVE SHOWN TO BE THE CHIEF NEEDS OF THE SOILS

The results of experiments that have been conducted in this county on Cecil Sandy Loam, in Mecklenburg County on Cecil Clay, and in Iredell on Cecil Clay Loam, have shown as an average of many trials that nitrogen and phosphoric acid are the plant-food constituents chiefly needed by these types of soil in average condition at the present time.

Potash has not generally been found to be very essential for general crops, such as corn and cotton, grown in the section. It is more than probable that for such crops as tobacco and potatoes applications of potash, when the price is normal, may prove to be financially profitable. Especially is this so when the soils of these different types are low in organic matter.

Judging from the analyses of the soils of the different types found in the county, and from such information as has been obtained otherwise with reference to these soils, it is thought that nitrogen and phosphoric acid are the two controlling plant-food factors in crop production. Organic matter, too, with practically all of the soils is of the highest importance, and should be added in larger quantities than has been the case heretofore, as would be indicated by the small amount of organic matter contained at the present time. When leguminous crops and other cover crops are grown and plowed into the soil to increase the organic matter supply already present, it will be found that in most cases a fairly liberal use of lime will be essential for best returns. The experiments have indicated that where lime is used alone or in combination with other plant-food constituents it makes but poor showing, as does potash with soils low or only moderately well supplied with organic matter. Where the organic matter is increased, as should be the case, with the soils of the county, lime will become more essential and its proper use will be found to be, in most cases, profitable.

HOW TO SUPPLY THE PLANT-FOOD REQUIREMENTS

Nitrogen.—Soils that show a need for applications of nitrogen can usually be considered as deficient in organic matter, and when the organic matter is high the nitrogen content is also relatively high. Analyses and field results have shown that the soils of the county are generally low in nitrogen. One of the main problems for farmers is, therefore, to supply this constituent in large quantities and as cheaply as possible. The chief means that must be used in supplying this constituent will be by the growing of suitable leguminous crops on the land and the turn-



FIG. 9.—Typical farm home.



FIG. 10.—Second growth of pine forest on Cecil sandy loam soil, just north of Gastonia.

ing of all or part of these into the soil. By such a plan not only would the nitrogen be increased, but the physical properties of the soil would be greatly improved by the addition of the organic matter.

Other materials that may be depended upon are commercial fertilizers and farm manures. The commercial materials carrying nitrogen are usually quite expensive. It is frequently difficult to have low-priced products like corn pay well for other than moderate applications of commercial forms of nitrogen. Where cotton is grown and the prices secured are fairly good for the lint, farmers may usually use commercial forms of nitrogen and have them prove profitable if they are properly combined with other materials that will supply the other needs of the crop grown on their particular soils.

Where grains and grasses are the principal crops, other sources than the commercial ones will have to be depended upon usually. Barnyard manure furnishes one of the most desirable sources of this constituent, as there are contained large amounts of organic matter with the nitrogen and moderate amounts of phosphoric acid and potash. This material, however, is not a well balanced fertilizer for the soils of the county, and it will therefore have to be supplemented by materials carrying the required fertilizing constituents needed by the soils of the county, the chief of which, as indicated above, is phosphoric acid for the Cecil soils after nitrogen has been provided. As valuable as this material is, the supply of organic matter and nitrogen cannot be kept up by having to depend upon the manure produced on the farm, as this amount is relatively very small as compared with the acreage usually devoted to the growing of crops.

Phosphoric Acid.—This constituent is very low in the soils of the county. With the farmer it is necessary for him, in order that his profits may be greatest, to use the source of phosphoric acid that is going to give the highest net returns. Taking everything into consideration, the two commercial forms that will have to be depended upon at the present time are acid phosphate and basic slag. Of course, there will be added to the soil a considerable amount of phosphoric acid when manure, cotton-seed meal, soy-bean meal, or ground bone is used alone or when such materials as tankage and fish-serap are added to the soil. Where large amounts of organic matter are being turned into the soil in many cases it will probably be profitable to add finely ground phosphate rock. The organic matter in rotting will tend to bring into an available form some of the phosphoric acid contained in this material. Again, a good plan in many cases would be to add this material to manure in the stable as it is being formed, using at the rate of one to two pounds per day broadcast over the manure, making the applications about twice per week.

Potash.—With the soils of this county, as well as with Piedmont soils generally, the least important constituent of the main plant-foods has been found to be potash. Iredell clay loam has been found to be lower in this constituent than any other type of soil found in the county.

Generally speaking, the soils of the county contain enough potash in them for the growth of maximum crops for a number of years to come, but it is usually present largely in a quite insoluble form. It is therefore, generally, with the soils of this county, more of a problem of making the supply available than of increasing its content by the addition of materials supplying this constituent. Not only do the chemical analyses show a fairly liberal supply of this constituent in the soils, but experiments show in all cases that it is far less essential to be applied than is nitrogen and phosphoric acid, except with the latter in the case of the high phosphoric acid soils. When the price of potash is as high as it is now, its use will not usually pay with the ordinary crops of this section, such as cotton, corn, and small grains.

Lime.—When the main crops of the county, like corn, cotton, and the small grains, are grown continuously on the land without the turning in of leguminous crops, lime will not usually be found of primary necessity. However, when cover crops are used, as they should be on all the soils, especially on soils low in organic matter, lime usually will be found essential. Even with those soils high in lime, like the Iredell clay loam type, it will no doubt be beneficial to make applications of this constituent, as the lime in these soils is in the form of silicates, which do not act in the same beneficial way as does calcium carbonate in the form of limestone, shells or marl in neutralizing acidity and in making the soil sweet and favorable for the growing of leguminous crops.

FERTILIZER MIXTURES TO USE FOR DIFFERENT CROPS

For the average soils occurring in the county, it is recommended that for cotton 400 to 600 pounds of a mixture containing 10 to 12 per cent available phosphoric acid and $2\frac{1}{2}$ to 4 per cent of ammonia be used. When the price of actual potash is not greater than 5 to 6 cents per pound, it has been found profitable to use at least 2 per cent in the mixture. However, when the price of potash is as high as at present it will not generally be found to pay. A mixture that will give approximately this proportion is the following:

Acid Phosphate, 16 per cent	400 Lbs.
Cotton-seed Meal, $7\frac{1}{2}$ per cent	200 Lbs.
<hr/>	
Total	600 Lbs.

Other mixtures may be used in which dried blood, fish-scrap, sulphate of ammonia, or nitrate of soda may be substituted for the cotton-seed meal. In making the substitution, it may be done by using 47 pounds of blood, 75 pounds of fish-scrap, 30 pounds of sulphate of ammonia, or 42 pounds of nitrate of soda for each 100 pounds of cotton-seed meal in the mixture. If desired, especially on the sandier soils of the county, one-third to one-half of the nitrogen may be put in at the time the cotton

crop is planted, reserving the other half to two-thirds to be added as a side-dressing in the form of sulphate of ammonia or nitrate of soda about the first of July.

For corn, small grains, grasses, sorghum, grown on average soils in the county, except of the high phosphoric acid types indicated above, from 250 to 400 pounds of a mixture containing 10 to 12 per cent available phosphoric acid and 5 to 6 per cent of ammonia will give good results. Potash up to $1\frac{1}{2}$ to 2 per cent in the mixture has been found to pay when this constituent is selling at normal prices. A mixture that will give approximately the right quantities of nitrogen and phosphoric acid is as follows:

Acid Phosphate, 16 per cent.....	200 Lbs.
Cotton-seed Meal, $7\frac{1}{2}$ per cent	200 Lbs.
<hr/>	
Total	400 Lbs.

Here, as above, the other recognized suitable carriers of nitrogen may be substituted for the cotton-seed meal in the proportions indicated.

For clovers, cowpeas, soybeans, vetch, and other leguminous crops, 300 pounds of 16 per cent acid phosphate will usually be found satisfactory on soils containing a moderate amount of organic matter. This quantity may be increased to 500 pounds to good advantage. Potash supplying materials are not usually necessary on these soils. In case the land is very poor, so that the young plants do not start off well, a sufficient amount of cotton-seed meal, dried blood, or other nitrogen-furnishing material may be added which will supply nitrogen to give 1 to 2 per cent in the mixture. When 300 to 500 pounds of 16 per cent acid phosphate is used, 50 to 75 pounds of cotton-seed meal or its equivalent in nitrogen content of blood, or other nitrogen carrier, may usually be used to good advantage. If it is discovered after the plants have gotten well started in this growth that nitrogen is needed, as will be indicated by a small slow growth and pale sickly appearance, a top dressing of 50 to 75 pounds of nitrate of soda per acre may usually be applied with profit.

With all the fertilizer mixtures given above as the amount of organic matter turned back into the soil increases, the amount of cotton-seed meal or other nitrogenous material may be reduced. In fact, when the supply has been made liberal in the soil it may be possible to entirely leave out of the mixture any nitrogen-carrying material. It should be the aim of the farmers of the county, as nearly as practicable, to obtain this condition with their soils.

CROP ROTATION NECESSARY FOR PERMANENT SYSTEM OF AGRICULTURE IN THE COUNTY

It is the duty of every owner of farm lands in the county to follow methods of crop rotation and fertilization that shall at least maintain the producing power of fertile soils and which shall build up the produc-



FIG. 11.—Preparing land for corn with a disk harrow.

tivity of the poorer ones. The methods in common use by the farmers should be such that their soils would become more productive year by year. The investigations that have been carried on by the Division of Agronomy in previous years have been conducted primarily to determine the most economical methods of fertilizing the various soil types of this and other counties of the State, and to take the information thus secured and apply it in conjunction with systems of crop rotation for the purpose of increasing the producing power of the soils. From information thus secured we are able to recommend methods which, if followed by the farmers of Gaston County, will maintain their soils in a far more productive state than they are at the present time, using the methods that are now commonly in practice. In providing the necessary plant-food constituents as recommended above, it is necessary to adopt a proper system of crop rotation if the largest and most profitable returns per acre are to be secured. The following rotations are recommended as well adapted for conditions prevailing in the county.

First Year.—Corn, with soybeans or cowpeas drilled in row at planting or before the first cultivation. They may, too, be sown broadcast just before the last cultivation.

Second Year.—Wheat or oats, red clover.

Third Year.—Red clover.

This is a short rotation and is admirably adapted for more wide use on the grain farms of the county. The corn stover and wheat straw secured should be plowed under or fed to stock and the manure carefully saved and returned to the soil. The soybeans or cowpeas and last crop of red clover should be turned under after saving the seed.

In starting this rotation on average soils, it is recommended that an application of 200 to 400 pounds of acid phosphate be used under the corn and that 74 pounds to 100 pounds of nitrate of soda be used as a top-dressing alongside of the rows about 2 to 3 inches from the plants about the first of July. If available, farm manure may be used with the acid phosphate, and the nitrate in this case could be eliminated entirely. This fertilization applies to the more extensively tilled soils. The nitrogen application could be greatly reduced or left off entirely on new land or on other soils containing a goodly supply of organic matter. Unless lime has been applied within the last two or three years, an application of 2,000 pounds of ground limestone per acre should be added to those soils on which legumes are to be grown and to those containing a considerable amount of organic matter. The lime should be applied broadcast and be thoroughly incorporated with the surface soils by means of a disk or spike-tooth harrow at the time of preparing the land for a corn or wheat crop.

During the first year wheat or oats are grown on the land they should receive similar treatment to that recommended for corn. In addition to the acid phosphate, it would be well to apply 200 to 400 pounds of rock phosphate per acre, as this fertilization is for both the wheat and clover crops that are to follow.

An application of 600 to 800 pounds of rock phosphate per acre to a good crop of clover before it is turned under in the fall might furnish much of the phosphoric acid required by the crops during the second period of rotation. Within a comparatively short time enough nitrogen should be furnished by the soybeans, or cowpeas, the clover and the roughage or stable manure, if the crops are fed and the manure saved and applied back on the land or the crops are plowed directly into the soil after maturity. Then the use of nitrate might be entirely dispensed with. The application of rock phosphate and lime should be made every four or five years. Live-stock farming in connection with this rotation might help in improving the productivity of these soils.

FOUR-YEAR ROTATIONS

A good four-year rotation is the same as the above, with oats and soybeans or cowpeas following corn the second year.

Other four-year rotations which could be adopted in this county are:

First Year.—Corn.

Second Year.—Crimson clover and cowpeas or soybeans.

Third Year.—Wheat and oats, red clover.

Fourth Year.—Red clover.

Or for sections of the county in which cotton is grown one similar to this might be used:

First Year.—Corn.

Second Year.—Wheat or oats, red clover.

Third Year.—Red clover.

Fourth Year.—Cotton, rye.

A similar method of fertilization should be adopted with these four-year rotations as is given for the three-year rotation.

FIVE- OR SIX-YEAR ROTATIONS

Any of these rotations with two years of pasture added would make them even better adapted to live-stock farming. Where it is desired to grow cotton, the following six-year rotation should under an intelligent supplemental system of fertilization and proper cultivation give good results.

First Year.—Corn, with cowpeas in the row or sown broadcast just before the last cultivation.

Second Year.—Cotton, with rye sown broadcast in the cotton after the first picking and covered with a harrow or light cultivator.

Third Year.—Rye plowed under, cowpeas, wheat or oats.

Fourth Year.—Wheat or oats, red clover.

Fifth Year.—Red clover.

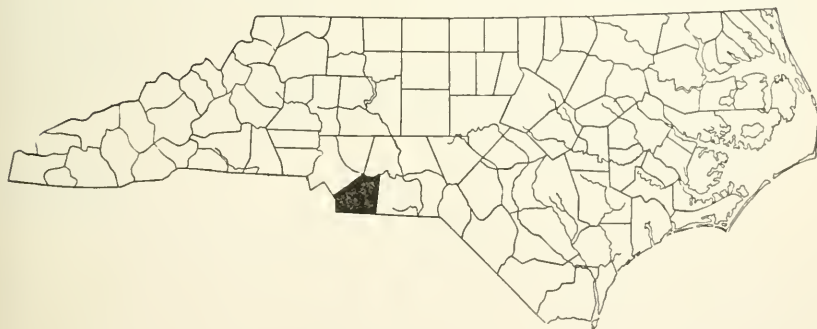
The fertilizer here, too, would be similar to that indicated above for a three-year rotation.

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COUNTY SOIL REPORT No. 3

REPORT ON
UNION COUNTY SOILS AND AGRICULTURE



Map showing soil survey area of Union County. This work was done by the Division of Agronomy of the State Department of Agriculture in coöperation with the Bureau of Soils of the Federal Department of Agriculture.

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LETTER OF TRANSMITTAL

WEST RALEIGH, N. C., June 29, 1917.

SIR:—Herewith I transmit a *Report on the Soils and Agriculture of Union County*. The data on the soils included in the report were gathered in a systematic soil survey of the county made in 1914 in coöperation with the Bureau of Soils of the United States Department of Agriculture.

In the recommendations with reference to the soils and their plant-food requirements we have been largely guided by the results secured in carefully conducted soil-type field experiments in Union and adjoining counties.

I would recommend that this report be issued as *County Report, No. 3*.

Respectfully submitted,

C. B. WILLIAMS,
Chief, Division of Agronomy.

Approved:

W. A. GRAHAM, *Commissioner of Agriculture.*

REPORT ON UNION COUNTY SOILS AND AGRICULTURE

BY C. B. WILLIAMS, W. E. HEARN, J. K. PLUMMER, AND W. F. PATE.

Union County lies in the southern part of the State, about midway between the coast and the mountains, and contains 630 square miles, or 403,200 acres. It is bounded on the north by Mecklenburg, Cabarrus, and Stanly counties, on the east by Anson County, on the south by South Carolina, and on the west by South Carolina and Mecklenburg County.

The general surface features of Union County are by far smoother than most of the Piedmont region in North Carolina. Most of the county consists of broad, smoothly undulating or gently rolling inter-stream areas which become more rolling and somewhat hilly as the streams themselves are approached. Some of the flatter areas are found in the vicinity of Indian Trail. The roughest surface area is characterized by steep slopes and broken ridges are developed in the northern end of the county along Rocky River in a belt about 3 to 6 miles wide and to the south of Stallings along the western border of the county, and also in a small area in the southeastern corner on each side of Brown Creek.

The streams in these localities have cut narrow channels of about 50 to 150 feet below the general level of the country, while through the greater part of the county the streams have cut shallower channels and the approaches to these are more gradual. Bordering all the streams are narrow strips of level first bottom-land which is subject to overflow during freshets. The greater part of the land's surface of Union County occupies a very favorable position for the operation of all kinds of modern farm machinery.

The highest elevations so far determined in the county are in the western part, and the elevation at Weddington is 725 feet. There is a gradual slope from this point in both an easterly and southeasterly direction. Other elevations along the Seaboard Air Line Railway are Indian Trail, 690 feet; Waxhaw, 645 feet; Monroe, 576 feet; Marshville, 554 feet; and Wingate, 545 feet above the sea-level.

All of the county is exceptionally well watered by numerous running streams, and good natural surface drainage exists except on a few of the flatter and more level areas. Even in these localities open ditches or tile drains would serve the purpose. On the more rolling and hilly areas drainage is excessive in many places, resulting in such rapid run-off of the rain water that gullies are frequently formed. Rocky River is the only stream in the county that has sufficient fall for the development of any great amount of water-power, and it furnishes power for a few grist mills and cotton gins.

The county as a whole has good transportation facilities. The Seaboard Air Line between Wilmington and Charlotte passes through the

county and also the main line of the same system from Richmond and Norfolk, Virginia, to Atlanta, traverses the county in a southwestern direction. A proposed railroad from Pageland, South Carolina, to Salisbury, North Carolina, would cross the north central part of the county, passing through Monroe. When this line is completed all sections of the county will be in close proximity to lines of transportation. There is a considerable mileage of well graded highways in the county



FIG. 1.—Scene showing rolling nature of the lands of the county.
A typical house is seen in the background.

and also a few miles of macadam road. The main public roads throughout the county are kept in good repair.

According to the 1910 census, Union County has a population of 33,277. Monroe, the county-seat, is 25 miles southeast of Charlotte. This town, together with Waxhaw and Marshville, constitute the main local markets for all kinds of farm produce of the county.

CLIMATE.

The climate of Union County is warm temperate. The winters are short and comparatively mild, and the summers long, but usually not

excessively hot. The figures in the appended table, which have been compiled from records of the Weather Bureau station at Monroe, are indicative of the general conditions in this county.

NORMAL MONTHLY, SEASONAL, AND ANNUAL TEMPERATURE AND PRECIPITATION
AT MONROE.

Month	Temperature			Precipitation		
	Mean	Absolute Maximum	Absolute Minimum	Mean	Total Amount for the Driest Year	Total Amount for the Wettest Year
	<i>*F.</i>	<i>*F.</i>	<i>*F.</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
December.....	42.6	75	5	3.46	3.78	4.19
January.....	41.2	78	5	3.10	2.59	5.21
February.....	40.9	76	—10	4.76	4.15	5.62
Winter.....	41.6			11.32	10.52	15.02
March.....	52.3	91	10	4.15	2.22	4.67
April.....	57.9	92	17	3.45	.85	3.82
May.....	65.3	100	28	3.62	2.34	3.21
Spring.....	59.5			11.22	5.41	11.70
June.....	74.6	101	43	5.11	4.34	3.88
July.....	78.0	103	47	5.23	5.46	4.80
August.....	76.7	100	44	7.03	11.89	19.38
Summer.....	76.4			17.37	21.69	28.06
September.....	70.7	100	35	3.93	1.31	5.09
October.....	59.0	91	23	3.49	.98	7.52
November.....	50.1	80	9	2.90	3.64	1.68
Fall.....	59.9			10.32	5.93	14.29
Year.....	59.4	103	—10	50.23	43.55	69.07

According to these records the mean annual temperature is 59.4° F. and the mean annual precipitation about 50 inches. The rainfall is ample and well distributed throughout the year. Droughts seldom occur, and damage to crops is rarely suffered, except on the porous soils of the slate belt. Snows occur frequently, but are generally of short duration.

The average date of the first killing frost in the fall is October 12, and of the last in the spring, April 21, giving a growing season of about 174 days, which is sufficient for growing a wide range of crops. The date of the earliest recorded killing frost in the fall is October 3, and of the latest in the spring, May 10.

The weather during the spring and fall months is almost ideal, and even during the winter it is sufficiently open to permit a good deal of farm work, such as clearing the land and plowing.

Union County is favored with a high elevation,*excellent natural surface drainage, and healthful and abundant supplies of water from open and driven wells. The latter type of well is rapidly supplanting the open ones, being more sanitary and healthful.

AGRICULTURE.

Union County has been settled since the latter half of the eighteenth century. It has always been an agricultural region, though the manufacture of cotton has grown to considerable importance.

Agriculture has passed through several stages from the mere growing of a few necessities through the commercial production of live stock and small grain to the production of cotton mainly, with corn next in importance, and a varied list of minor products, grown chiefly to supply the local markets. Not until 1800 was cotton grown commercially. This was near Waxhaw, and cotton became an important crop in the western part of the county between this time and the opening of the Civil War. It was not grown to any extent in the eastern part of the county until after the war.

About 1820, German farmers living in the northern part of the county grew tobacco as a commercial crop, rolling the product in hogsheads to Fayetteville. During the same period, 1820 to 1830, wheat was an important product. Prevalence of the Hessian fly caused a practical cessation of wheat growing about the latter year, though the crop was important for a time later, as will be seen. Flax was another of the crops important in the early agriculture.

The following table, compiled from the reports of the Federal census, will serve to indicate roughly the agricultural evolution of the county since 1850. The statistics also have significance as showing the crops that have from time to time been profitable to the farmers, and that, therefore, may under certain economic conditions existing or to arise again become important.

PRINCIPAL AGRICULTURAL PRODUCTS OF UNION COUNTY, 1850 TO 1910 CENSUSES.

Crop	1850 Production	1860 Production	1870* Production	1880	
				Acreage	Production
Cotton (bales).....	12,264	3,054	1,196	19,090	8,336
Corn (bushels).....	39,875	301,175	203,032	28,877	338,520
Oats (bushels).....	314,421	25,098	72,308	14,357	101,719
Wheat (bushels).....	59,856	76,321	79,934	12,464	49,783
Rye (bushels).....	-----	585	256	12	67
Potatoes (bushels).....	7,542	7,532	8,167	-----	5,146
Sweet potatoes (bushels).....	34,318	33,653	16,945	222	19,218
Peas and beans (bushels).....	5,645	18,740	3,176	-----	504
Tobacco (pounds).....	641	4,088	8,262	9	3,467
Wool (pounds).....	18,000	14,520	12,444	-----	15,685

*Acreage not given. †Bales of 400 pounds.

PRINCIPAL AGRICULTURAL PRODUCTS OF UNION COUNTY, 1850 TO 1910
CENSUSES—CONTINUED.

Crop	1890		1900		1910	
	Acreage	Production	Acreage	Production	Acreage	Production
Cotton (bales).....	36,838	8,889	45,157	34,441	47,686	22,526
Corn (bushels).....	29,691	327,731	39,970	452,970	38,313	521,883
Oats (bushels).....	17,239	111,115	7,838	61,670	10,746	127,710
Wheat (bushels).....	13,872	67,602	15,847	75,770	5,815	33,626
Rye (bushels).....	21	99	43	360	62	390
Potatoes (bushels).....	79	4,955	52	3,291	129	12,613
Sweet potatoes (bushels).....	403	36,907	396	28,304	565	58,595
Peas and beans (bushels).....		43	203	2,075	510	2,171
Tobacco (pounds).....	1	120				105
Wool (pounds).....		11,951		5,867		*1,300

Live Stock	1850	1860	1870	1880	1890	1900	1910
Hogs (number).....	15,646		12,163	16,603	10,717	9,585	8,850
Cattle (number).....	9,285	10,055	8,236	9,588	7,644	8,329	11,177
Sheep (number).....	11,635	11,641	8,973	10,684	6,696	2,981	1,067
Horses and mules (number).....	2,820	2,923	2,605	3,376	37,733	5,637	7,076

*Estimate.

An inspection of this table, unsatisfactory as it is, owing to its fragmentary nature, shows in general the same products in 1850 as in 1910, the most striking feature being merely an increase in the volume of the production. During this 60-year period cotton and corn, if we omit the war period, have steadily increased in production; oats and wheat have fluctuated very widely, and rye and hay have never been important. Tobacco increased in importance until 1870, when it declined, and has since been practically abandoned; wool production declined from 18,000 pounds to a little over 1,000 pounds. Wheat and oats were more important in 1850 than in 1910.

Of live stock, the number of hogs and sheep was much greater in 1850 than in 1910, and only cattle, horses, and mules have increased in number.

Horses, hogs, and cattle are raised on most farms, but only a few sheep and goats are seen. Dairying is not well developed, although the local markets are supplied with milk and butter, large quantities of butter being shipped weekly to Monroe, Marshville and Waxhaw. Poultry raising is rather well developed and yields considerable revenue.

Some of the best farmers precede their corn and cotton with a winter cover crop of crimson clover, vetch and oats, vetch and rye, or rye. Where no cover crop is used, the best results are obtained by deep fall or winter plowing, followed by spring plowing and frequent shallow cultivations to insure perfect tilth.

Corn yields best on bottom lands. It has been found that corn planted in deep furrows, particularly on the rolling uplands, has a better rooting

system, and for this reason withstands the drought better than if planted 2 or 3 inches under the surface. Cocks's Prolific and some yellow dent varieties give good yields on the Piedmont soils. As spring-sown oats seldom yield well, on account of the early droughts and rust, only winter oats are grown in Union County, the principal varieties being Hundred Bushel and Appler. From October 15 to November 15 is apparently the best time to sow oats in Union County. Oats usually receive an application of acid phosphate and potash in the proportion of 8-4 or 10-4 at seeding time and a top dressing in early spring of 75 to 100 pounds of nitrate of soda.

At present very little wheat is grown in the county, although a larger acreage is probable this season than has been customary, owing to the high prices of breadstuffs.

Best results are obtained from crimson clover where the land has received an application of something like 2,000 to 3,000 pounds of carbonate of lime per acre prior to seeding. In many localities inoculation of the seed is necessary. Clover is sown at the last cultivation of the corn, after the first picking of cotton, or in cowpeas. Vigorous growths are obtained when 200 to 400 pounds per acre of acid phosphate are applied. Crimson clover is sown in this county from September 15 to October 5. It is often sown with oats for hay. For successful growth red clover requires inoculation on land where it has not been previously grown, and usually as heavy application of lime as for success with crimson clover. Bermuda grass is counted one of the best pasture grasses in the county.

There is no system of crop rotation generally practiced throughout the county. A few farmers follow a definitely planned cropping system which could be profitably applied to most of the soils of the county. Where general farming is followed a good rotation now in use is as follows: First year, cotton, sowing crimson clover in the fall; second year, corn, sowing cowpeas at last cultivation; third year, a small-grain crop, sowing cowpeas again after harvesting crop, to be followed by a nitrogen-gathering crop. The soil so treated shows steady improvement and many farmers are now beginning to practice this rotation. Others alternate corn and cotton, with no winter cover crop. The slate and granite soils, with the exception of the slaty and shallow phases in the "slate belt," produce good yields of corn, cotton, oats, wheat, cowpeas, rye, and where lime and inoculated seed have been used, the clovers and vetches. Rye does best on sandy soils. Wheat, oats, and clovers prefer the heavier types of the Georgeville and Cecil series. Sweet potatoes, peanuts, and early truck crops make their best development on the light sandy loams. Cabbage, Irish potatoes, sweet corn, tomatoes, and strawberries do best on the sandy loams and the Cecil clay loam. The lighter areas of the sandy loams and the slate soils give the best returns with apples, peaches, pears, grapes, and other fruits. The Cecil and George-

ville soils give a higher color and better flavor to all fruits. The Durham soils are well adapted to the production of bright tobacco.

The farmers of this county are using larger quantities of commercial fertilizer each year. The most common formulas used are 8-2-2 and 8-3-3. For cotton applications usually from 200 to 400 pounds per acre are used. Oats generally receive 200 to 300 pounds of 8-4 or 10-4 at sowing time, nitrogen being applied in early spring in the form of nitrate of soda at the rate of about 100 pounds per acre. Many farmers buy cotton-seed meal, acid phosphate, and kainit or muriate of potash and mix them at home in the proportions suitable for their individual needs. Watermelons regularly receive acreage applications of 8 to 10 loads of stable manure and 400 to 500 pounds of a fertilizer analyzing 8-3-3. Throughout the county the soils are prevailingly light in color, indicating a deficiency in organic matter.

Efficient farm laborers are usually paid about 75 cents to \$1 a day. Women receive about 50 cents. Monthly wages range from \$15 to \$20 with board, or else a dwelling-house, firewood, and garden patch. Cotton pickers receive from 50 to 75 cents per hundred pounds, the higher rate prevailing near the close of the season. Most of the laborers are negroes. There is a growing tendency for the farmer to cultivate only as much land as he and his family can successfully care for without the aid of hired labor.

According to the census, there were 3,793 farms in the county in 1900 and 4,856 in 1910, showing an increase of 1,063; but there was only a slight increase in the acreage of cultivated land.

Before the Civil War farms and plantations contained from 1,000 to 4,500 acres, particularly in the western half of the county; but since that period these large tracts have been divided and now only about $3\frac{1}{2}$ per cent of the farms in the county contain more than 260 acres, while 74.3 per cent contain less than 100 acres, the average size for the entire county being 74.1 acres.¹ Small holdings of 20 to 50 acres are most numerous.

According to the 1910 census, 43 per cent of the farms in Union County are operated by the owners, 56.8 per cent by tenants, and 0.2 per cent by managers. Farms are rented either for cash or on shares, the latter being the most common practice. Where the land alone is supplied, the owner receives one-fourth to one-third of the crops produced. Where the owner furnishes the land, work stock, feed for stock, implements, and one-half the fertilizer, he receives one-half of all the crops produced.

Land values vary greatly, being governed by location and improvements. In a narrow strip 3 to 6 miles in width south of Rocky River land can be bought at \$8 to \$15 an acre. Some parts of this section, which support a good timber growth of red, white, and post oak, heart pine, and hickory, bring higher prices, depending upon the quantity

¹The census tabulates each tenancy as a "farm."

of merchantable timber and the character of the topography. Farm lands in the vicinity of Monroe, Marshville, and Waxhaw sell for \$35 to \$75 an acre, while 5 to 10 miles from these towns the price ranges between \$20 and \$40 an acre.

The variety of soils, favorable topographic position, and healthful climate of Union County are favorable to the development of a highly



FIG. 2.—A typical forest growth of pines.

diversified agriculture. All the soils in the county have clay subsoils, which underlie the surface at no great depth. This permits the land to be built up to a high state of productiveness and to be easily maintained in that condition.

SOILS AND THEIR ORIGIN.

Union County lies wholly within the Piedmont plateau province, and all of its soils, with the exception of small strips of bottom land, have been formed through the process of decay from the underlying rocks. This is one of the so-called slate counties of the State, and about 90

per cent of the soils in this county have been derived from the slate rock. The slate when fresh is dark green, dark to light blue or grayish, but upon weathering and oxidation the colors become brilliant, and shades of purple, blue, green, red, yellow, and gray are common.

The slate rocks are fine-grained. Soils derived from them are silty in texture, having a smooth, floury feel. Through the weathering of these rocks the Georgeville and Alamance soils are formed. The Georgeville soils are gray to red in the surface and have red silty clay subsoils. The Alamance soils are light gray to whitish in the surface portion and have yellow friable subsoils. The red color of the Georgeville soils is due to the large amount of iron in the slate rock or to a further oxidation of the iron than is seen in the lighter color of the Alamance. The Georgeville series embraces the silt loam, gravelly silt loam, silty clay loam, and slate loam types. The Alamance series embraces silt loam, silt loam of shallow phase, gravelly silt loam, and slate loam types. Generally these slates have weathered to a depth of 2 to 4 feet or more, but in many places the broken slate occur near the surface and frequently outcrops on the knolls and ridges. Distributed over a considerable part of the surface are many smooth rounded brown or gray pebbles and fine platy thin fragments of slate.

Along the western border and in the southwestern part of the county are granite, gneiss, and diorite rocks. These rocks differ in their composition from the slates, and the soils derived from them are entirely different in texture and structure. Most of these rocks are high in potash and carry a large percentage of quartz which upon breaking down furnishes the sand so characteristic of these soils. The granites and gneiss decay into the Cecil and Durham soils. The Cecil soils are gray to red in the surface portion, and have red, hard brittle clay subsoils. The Cecil sandy loam, fine sandy loam, and clay loam occur. The Durham soils are light gray, underlain by yellow friable clays, and two types, the Durham sandy loam and fine sandy loam, were mapped. The rocks forming the Cecil soils contain a higher percentage of the iron-bearing minerals than those giving rise to the Durham and the oxidation of this gives the intense red color to the Cecil soils.

The dark green or "nigger head" rocks, known as diorite, occurring in the western part of the county, give rise to the Iredell loam. This is a dark gray to brown soil and has a sticky, waxy, yellowish-green or yellowish-brown clay subsoil which is readily distinguished from its associated soils. The subsoil frequently rests upon the bedrock at 20 or 30 inches below the surface.

Gray to red medium textured sandstone and blue shale rocks occur in the extreme southeastern corner of the county. These rocks decay into a gray soil having a yellow or mottled yellow and gray subsoil grading into red within the 3-foot section. This soil has been classed as the Granville sandy loam.

Bordering the streams are bottom lands or alluvial soils representing

material washed from the uplands and deposited by overflow waters. This material has been separated into two types according to the color, drainage and crop value. The brown bottom soil is the Congaree silt loam, while the whitish or gray bottom land has been mapped as the Wehadkee silt loam.

The following table gives the names and the actual and relative extent of the several soils mapped in the county:

AREAS OF DIFFERENT SOILS.

Soil	Acres	Per Cent	Soil	Acres	Per Cent
Alamance silt loam.....	94,528	24.7	Cecil fine sandy loam.....	9,408	2.3
Shallow phase.....	4,992		Iredell loam.....	9,280	2.3
Alamance gravelly silt loam...	68,096	16.9	Cecil sandy loam.....	5,952	1.5
Georgeville gravelly silt loam...	62,592	15.5	Durham sandy loam.....	4,416	1.1
Georgeville silt loam.....	56,064	13.9	Wehadkee silt loam.....	4,096	1.0
Congaree silt loam.....	20,160	5.0	Durham fine sandy loam...	1,792	.5
Georgeville silty clay loam.....	19,776	4.9	Granville sandy loam.....	1,536	.4
Alamance slate loam.....	13,760	3.4			
Cecil clay loam.....	13,376	3.3	Total.....	403,200	
Georgeville slate loam.....	13,376	3.3			

ALAMANCE SILT LOAM.

About one-fourth of the county, or 94,528 acres, are included in the Alamance silt loam. It is the most extensive and widely distributed soil in the county. Some of the largest areas lie to the south of Monroe, east of Mount Prospect Church, along the Seaboard Air Line Railway between Bakers and Stout, and to the south of Brief.

This soil is locally called "white floury land" because of its mellow, smooth, silty texture and whitish appearance. The first few inches of the surface is a light gray silt loam, passing into a yellowish gray to pale yellow silt loam, which extends to a depth of 6 to 10 inches. The subsoil is a yellow compact but friable silt loam to silty clay loam. On the ridges and better drained areas the lower part of the 3-foot section may show a reddish tinge, while upon the flatter areas or slightly depressed situations mottlings with shades of gray and white are common. Occasionally on the ridges and knolls a few white quartz rock and fine slaty fragments are present.

The surface of this soil is prevailingly smooth, being flat to gently rolling and most favorable for the use of farm machinery. All of it excepting the flatter and more depressed areas is well drained. Open ditches or tile drains will serve every purpose for adequate drainage.

In its natural condition it is deficient in organic matter and is not highly productive, but when supplied with vegetable matter, manure, lime, and fertilized, it gives good yields of corn, oats, wheat, rye, cot-

ton, sweet and Irish potatoes, and garden vegetables. This soil when plowed under proper moisture conditions works up to a good tilth and is easily cultivated. It responds readily to manure and fertilizers.

Alamance Silt Loam, Shallow Phase.—This phase occurs in small areas and has been shown on the soil map by cross lines upon the Alamance silt loam color. It was separated from the Alamance silt loam



FIG. 3.—A not uncommon type of modern road seen in the county.

because the broken shale or solid bedrock comes within 8 to 15 inches of the surface and frequently outcrops or has only a thin covering of soil over the rock. Scattered over the surface there is a large quantity of fine slate particles and occasionally a few quartz rock.

It occupies narrow ridges, knolls, and the steeper slopes adjacent to the streams. It is well drained and also droughty, due to the nearness of the underlying rock. It is liable to bake and pack and is greatly benefited by coarse manures or turning under green manuring crops. Its agricultural value is considerably lower than that of the Alamance silt loam.

In the following table is given the analyses of Alamance silt loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

		Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
		Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	} 2 mm. {	.080	.025	.477	.172	1302	407	7766	2800
Subsoil		.045	.049	.535	.204	3485	3795	41430	15798

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.9	2.9	1.4	4.1	13.0	63.1	13.7
Subsoil.....	0.6	0.9	0.4	0.9	13.9	33.6	49.1

ALAMANCE GRAVELLY SILT LOAM.

This soil is locally the “white gravel land” and is the second largest type in the county, covering as it does 68,096 acres. The surface soil is whitish to light gray or yellowish-gray silt loam, having a depth of 5 to 8 inches. The subsoil is a yellow silty clay loam or brittle clay having a depth of 3 feet or more. Distributed over the surface and mixed with the soil is approximately 15 to 50 per cent of small smooth flat rounded brown and gray shale particles, giving the roads and abandoned fields a brown appearance. Some red or reddish-yellow colorations may be noticed in the subsoil on the ridges and bordering the Georgeville types, while shades of gray and white are seen in the flatter or depressed areas. Adjoining the Iredell loam the subsoil is somewhat variable and a brown tough clay is frequently found.

The gravelly silt loam is well distributed over the northern and eastern parts of the county, occurring in large areas to the north and south of Marshville, south of Olive Branch, in the vicinity of Euto, and around Benton Cross Roads Church. Its surface is gently rolling to rolling, having smoothly rounded slopes and knolls and lying favorably for farming operations with improved machinery.

In crop adaption and yields the gravelly silt loam is quite similar to the Alamance silt loam. It is claimed by the farmers that the presence of the rounded and platy particles of slate cause the soil to be easier to till, renders it more retentive of moisture, and is less liable

to bake or run together than the silt loam. These particles also prevent to a noticeable extent surface washing and erosion. Like the other Alamance types, it is deficient in vegetable matter, and this can be supplied by turning under green manuring crops or by the addition of barnyard manure. Deeper plowing and thorough pulverization of the soil is recommended for increasing the yields.

In the following table is given the analyses of Alamance gravelly silt loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

		Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
		Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	} 2 mm. {	.066	.075	.352	.347	853	969	4548	4483
Subsoil		.047	.049	1.082	.204	3102	3234	71412	13464

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.9	2.9	1.4	4.1	13.0	63.1	13.7
Subsoil.....	0.6	0.9	0.4	0.9	13.9	33.6	49.1

ALAMANCE SLATE LOAM.

The fine material of the surface portion of this soil consists of a gray silt loam underlain at about 6 inches by a pale yellow compact silt loam or silty clay loam which extends to a depth of 10 to 18 inches. Below this is found broken slate or bedrock. In places the slate rock outcrops or immediately underlies a thin covering of surface soil. Gray or bluish slate fragments of varying sizes are strewn over the surface and mixed with the soil. These fragments interfere with cultivation, and only the less stony areas are cultivated. Most of the type should be devoted to pasturage or forestry purposes.

It is excessively drained, and crops suffer from ordinary droughts. There are almost 14,000 acres of this type developed on the ridges, knolls, and hilly areas scattered throughout the southeastern, central, and extreme northern parts of the county. Some corn, cotton, and sorghum are grown on the areas where there are a few inches of sub-

soil and the least amount of slaty fragments. The yields of these crops are generally less than upon the associated slaty soils.

In the following table is given the analyses of Alamance slate loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.*

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.101	.096	1.83	.30	915	870	16580	2718
Subsoil }	.042	.131	3.14	.101	3360	10480	251200	8080

*The analysis of this type is of a sample taken in Cabarrus County.

GEORGEVILLE SILT LOAM.

Almost one-seventh, or about 56,000 acres, of Union County is covered by the Georgeville silt loam. The surface to a depth of 6 to 10 inches is a silt loam having a mellow structure and floury feel, and ranging in color from a light gray to dull red. It is underlain by yellowish red silty clay loam which quickly grades into a dull red or bright red, brittle silty clay, usually extending to a depth of 3 feet, but occasionally at 2½ feet purplish slate rocks are reached. On eroded slopes the silty surface soil has in places been removed, exposing the red silty clay.

This is one of the important types of the county, occurring in large areas to the south and northwest of Monroe, south of Pleasant Grove Church, in the vicinity of Beulah Church, to the south of Unionville, and also in many scattering bodies. It has a gently rolling to rolling surface, the smoother and more level portions occurring on the broader divides. Near Rocky River and the larger creeks and along the South Carolina line it becomes hilly and rough in places. All of it is naturally well drained.

This soil is easy to till if handled under proper moisture conditions; otherwise it is liable to bake slightly or dry out in clods. It should be plowed and filled with vegetable matter or given a liberal application of barnyard manure. The effects of the vegetable matter are quite lasting, due to the firm clay subsoil. Lime is beneficial and profitable, when used properly.

The main crops are corn, cotton, oats, clover, and cowpeas, while sweet potatoes, garden vegetables, and fruits are also grown. Corn

fields 15 to 40 bushels, cotton $\frac{1}{4}$ to 1 bale, oats 15 to 65 bushels, and cowpea hay $\frac{1}{2}$ to 1 ton per acre. Clover does fairly well where the soil has been limed and the seed inoculated before sowing. This is one of the valuable soils of the county.

In the following table is given the analyses of Georgeville silt loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

	Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,600,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.044	.053	.56	.282	844	1017	10741	5409
Subsoil }	.029	.024	.916	.193	2278	1885	72747	15162

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	0.5	1.4	1.4	4.0	7.8	67.5	17.3
Subsoil.....	0.0	0.1	0.2	0.4	0.6	45.3	53.6

GEORGEVILLE GRAVELLY SILT LOAM.

The Georgeville gravelly silt loam is distinguished from the silt loam on account of approximately 15 to 50 per cent of small rounded smooth brown and gray slaty particles distributed over the surface and mixed with the soil. The roads and even the fields where plowing has not been done recently present a brown appearance.

The surface is a yellowish gray to reddish yellow silt loam or loam ranging in depth from 6 to 12 inches. The subsoil is a dull red brittle silty clay, usually extending to a depth of 3 feet. In places the upper subsoil is a pinkish red or salmon red silty clay loam which quickly grades into the red silty clay. Occasionally angular fragments of slate or shale and even quartz occur on the surface.

This is one of the largest and most important types, covering as it does 62,592 acres. It is the main soil in the northeastern part of the county. Large areas also occur around Monroe, along Richardson Creek, and to the south of Rocky River. Its surface comprises gently rolling areas having smoothly rounded slopes and knolls and lying

favorably for the use of improved machinery. The natural drainage is splendid and the presence of the gravel and slate particles seems to prevent washing and erosion. This gravel also has a beneficial effect in rendering the soil more open and porous, and also to prevent baking or running together of the fine material.

The Georgeville gravelly silt loam is used principally for the growing of corn and cotton. However, all crops common to the county are



FIG. 4.—A typical modern farm home.

successfully produced. Corn yields from 15 to 40 bushels, cotton $\frac{1}{4}$ to 1 bale, oats 10 to 65 bushels, and cowpeas $\frac{1}{2}$ to 1 ton of hay per acre. Clovers do well where lime is applied and inoculation is given the seed or soil. Apples, peaches, pears, and figs give fair returns. This soil, owing to its good clay foundation, is capable of high improvement by turning under green manuring crops or barnyard manure and by deeper plowing, together with the addition of a liberal application of lime.

In the following table is given the analyses of Georgeville gravelly silt loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

	Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.083	.065	1.291	.263	872	683	13556	2762
Subsoil }	.059	.044	1.641	.403	4215	3143	117233	28790

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil-----	0.5	1.4	1.4	4.0	7.8	67.5	17.3
Subsoil-----	0.0	0.1	0.2	0.4	0.6	45.3	53.6

GEORGEVILLE SILTY CLAY LOAM.

There are about 20,000 acres of the Georgeville silty clay loam in Union County, the largest areas occurring in the western part to the north and northeast of Waxhaw. The type is locally known as "red land" and is the heaviest soil in the slate belt.

The surface soil is a red silty clay loam or heavy loam to a depth of 4 to 6 inches, underlain by a deep red heavy silty clay extending to a depth of 3 feet or more. This subsoil is hard and brittle when dry and plastic when wet. In spots the surface soil is a yellowish-gray to yellowish-red silt loam and frequently a few quartz fragments or slate particles are present on the surface.

The natural drainage is splendid, as all of the surface is more or less rolling and erosion has been quite active in places, resulting in the formation of shallow gullies. Red, white, and post oak and some hickory, poplar, and short-leaf pine are the principal trees on the undeveloped areas.

This soil is used for the growing of corn, oats, clover, cowpeas, and cotton. It is best suited to the production of corn, wheat, clover, and cowpeas. The type is capable of being built up to a high state of productiveness by deeper plowing, the incorporation of organic matter, either by turning under green manuring crops or by the addition of

barnyard manure. Since the soil is heavy, being fine in texture and rather compact, it requires strong teams and heavy machinery for the most profitable handling of the type.

In the following table is given the analyses of Georgeville silty clay loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.065	.105	.457	.293	1093	1766	7687	4928
Subsoil }	.012	.115	2.083	.196	960	9290	166640	15680

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil....	1.2	2.0	1.0	3.6	5.0	43.0	43.9
Subsoil.....	0.1	0.2	0.2	1.5	2.9	39.6	55.5

GEORGEVILLE SLATE LOAM.

The slate loam type covers about 13,000 acres and is developed mainly in the northeastern part of the county. It represents the roughest surface features of any soil in the county, consisting of strongly rolling to hilly areas bordering the larger streams. These slopes, however, have a comparatively smooth surface, and erosion is not very active.

This soil is distinguished from the silt loam on account of the large quantity of slate and shale rock fragments, ranging from 1 to 6 inches in diameter and being distributed over the surface and mixed with the soil. Usually the bedrock or broken slate is reached within 3 feet of the surface, and then outcrops in places.

Owing to the prevailingly rough surface and the presence of the slate fragments which interfere to a considerable extent with cultivation, very little of the Georgeville slate loam is cultivated. Most of the type is best suited to pasturage purposes and apple growing, and the rougher areas to forestry.

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	3.9	21.2	13.9	27.3	15.4	13.5	4.8
Subsoil.....	2.4	9.2	4.4	9.3	6.8	28.2	39.6

CECIL FINE SANDY LOAM.

There are about 9,400 acres of Cecil fine sandy loam in the southwestern corner and along the western border of the county. The more prominent areas are situated in the vicinity of Weddington, Gordon Store, north of Stallings, and west of Waxhaw. This soil is similar to the Cecil sandy loam, except that it is finer in texture and of a more mealy and loamy structure. It is a gray to light brown fine sandy loam, underlain by a bright red, stiff tough clay, usually extending to a depth of several feet. Spots of reddish-brown loam are found here and there, and such areas are heavier and are liable to clod and bake if not plowed and harrowed under proper moisture conditions.

Most of this type is developed on the broader interstream areas, whose surface is gently rolling to rolling, and has excellent natural surface drainage. It is easily handled with modern farm machinery. Crops and yields on this soil are practically equivalent to those on the sandy loam.

In the following table is given the analyses of Cecil fine sandy loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

		Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
		Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	} 2 mm. {	.032	.003	.24	.221	575	54	4315	3974
Subsoil		.041	.069	.616	.21	3250	5520	49280	16800

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.0	2.4	3.5	29.5	32.4	23.3	7.7
Subsoil.....	0.2	0.7	1.1	7.8	9.8	24.9	55.5

CECIL CLAY LOAM.

This is the "red clay land" of the southwestern corner of the county. It is the granite red clay as distinguished from the Georgeville silty clay loam derived from the slate rock. There are about 13,000 acres of this soil. The soil is a red or reddish-brown clay loam or loam to a depth of 4 to 8 inches.

It is underlain by a bright red stiff clay extending to a depth of several feet. The immediate surface may have a few inches of reddish-brown sandy loam, and this causes the soil to work into a better tilth than is usually obtained upon the heavy red clay. There are spots of dark brown or snuff-colored clay loam, commonly known as "dead land" or "push land," because it does not slide readily from the plowshare.

The natural drainage is good for all of the type, as the surface is gently rolling to hilly. Terracing the slopes to prevent washing and gullyng is practiced to some extent. The growing of winter cover crops and deeper plowing would retard in a large measure surface washing.

Corn yields from 15 to 60 bushels per acre, cotton, $\frac{1}{4}$ to $\frac{3}{4}$ bale, cowpeas from 1 to 2 tons of hay, or 10 to 20 bushels of seed per acre. Oats, wheat, and clover, as well as garden vegetables, do well upon this soil. The production of small grains should be increased, as good yields can be obtained when the soil is properly handled.

Some of the best farmers have increased yields very greatly by deeper plowing, preferably in the fall, rebreaking and harrowing in the spring, and by frequent cultivation, together with the turning under of coarse manures, cowpeas, or clover. It is naturally one of the strongest soils of the county and one capable of being improved to high state of productivity.

In the following table is given the analyses of Cecil clay loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.029	.052	.223	580	1040	11800	4160
Subsoil }	.064	.008	1.96	5120	640	156800	16960

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	3.4	10.1	8.9	20.8	8.4	29.0	28.5
Subsoil.....	0.9	5.3	4.0	9.8	5.6	17.6	56.7

DURHAM SANDY LOAM.

This is a whitish or light gray sandy land of the county and is developed along the Mecklenburg County line and also to the southwest of Waxhaw on the South Carolina line. There are about 4,400 acres of this land in Union County.

The surface soil is a gray to whitish sandy loam, grading at about 6 inches into a pale yellow sandy loam extending to a depth of 10 to 18



FIG. 5.—Spreading manure on the Alamance silt loam type of soil on stubble for a corn crop.

inches. The subsoil is a yellow friable heavy sandy clay or clay. It may be mottled in the lower part of the 3-foot section with red upon the knolls and ridges, while shades of gray are seen in the poorly drained places. Near Antioch Church the soil is a coarse sandy or fine gravelly loam, being loose and porous.

It has a smooth to gently rolling surface, drains out splendidly, warms up early in the spring, and is very easily handled with any kind of farm machinery. This soil is decidedly lacking in organic

matter, and the supply of this would greatly increase the yields and render the soil much more retentive of moisture. Bright tobacco is especially well suited to this soil, and similar soils are used for the production of this crop in Durham and other counties. Sweet potatoes, peanuts, watermelons, cantaloupes, and sorghum-cane give good returns. The main crops grown are corn, cotton, and cowpeas, and the yields of these are generally low except where the soil has been heavily fertilized or manured.

In the following table is given the analyses of Durham sandy loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

	Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.12	.015	.18	.241	2400	300	3600	4820
Subsoil }	.056	.033	.39	.111	4399	848	30638	8720

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	6.3	23.7	17.1	17.4	14.0	17.9	3.8
Subsoil.....	4.6	12.4	11.2	16.7	12.1	17.7	25.5

DURHAM FINE SANDY LOAM.

This is one of the smallest types in the county and is confined to small areas in the vicinity of Marvin and to a few isolated patches lying to the south of Waxhaw. The soil is a light gray fine sandy loam grading into a pale yellow fine sandy loam at about 4 to 6 inches and extending to a depth of 8 to 20 inches. The subsoil is a yellow friable fine sandy clay or clay. The type occupies the high ridges, being gently rolling to rolling, and has excellent natural drainage.

The crops and yields on this soil are quite similar to those on the Durham sandy loam. This soil needs organic matter, and this can best be supplied by turning under green manuring crops. Usually frequent and shallow cultivation serves every purpose for this soil.

In the following table is given the analyses of Durham fine sandy loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

		Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
		Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	} 2 mm. {	.012	.003	.542	.17	240	60	10840	3400
Subsoil		.02	.015	2.052	.21	1600	1200	164160	16800

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	3.8	11.6	15.2	33.4	13.6	19.2	3.3
Subsoil.....	4.8	10.0	9.8	17.0	7.6	20.1	30.6

IREDELL LOAM.

The Iredell loam, locally called "bull tallow" or "blackjack" oak land, comprises about 9,000 acres. It is readily recognized from the other soils by the peculiar or putty-like character of the subsoil and the dominant blackjack oak growth.

The surface soil is a dark gray to dull brown loam, having a depth of 6 to 12 inches. The subsoil is a dingy yellow or yellowish-brown, sticky, waxy, impervious clay, which grades at about 20 to 30 inches into the greenish-yellow soft rotten rock. A few small rounded brown to black iron pebbles or concretions are mixed with the surface soil. Spots of the surface soil are sandy, and again some of it is quite silty and contains slate fragments and even rock.

Most of this soil lies to the southwest of Stout, northeast of Indian Trail, north of Stewart Mill, and along the Mecklenburg County line bordering the bottom lands of Six-Mile Creek, and also in small areas in the vicinity of Walkersville Church and about 3 miles east of Waxhaw. The surface is comparatively flat to gently rolling, being broken near the stream courses, and the natural surface drainage is good except on the flat areas. Underdrainage is exceedingly poor on account of the dense structure of the subsoil.

This is a splendid grain soil, being especially suited to the production of oats. In recent years it is being recognized as one of the best soils in the county for the growing of cotton and corn. It responds readily to deeper plowing, thorough pulverization, and a liberal application of lime.

In the following table is given the analyses of Iredell loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

		Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
		Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	} 2 mm. {	.057	.078	.242	2,543	858	1175	3645	38298
Subsoil		.034	.081	.184	1,372	2317	5521	12541	93516

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	6.3	9.0	4.9	21.0	29.0	18.5	10.9
Subsoil.....	3.2	4.5	3.3	10.5	12.1	22.5	44.0

GRANVILLE SANDY LOAM.

In the extreme southeastern corner of the county bordering the Anson County line and adjacent to the bottom lands along Brown Creek are small areas of Granville sandy loam aggregating about 1,500 acres. This soil is recognized by the Indian red or purplish clay exposed in the gullies and road cuts and by the underlying sandstone rock.

The soil has a light gray sandy surface. This passes into a pale yellow sandy clay which within a depth of 3 feet is generally more or less mottled with Indian red. The surface is gently rolling to hilly and is well drained. It is subject to heavy washing and erosion, resulting in the formation of gullies, which unless checked will be a hindrance to cultivation.

Cotton, corn, cowpeas, and sweet potatoes are the main crops grown, and the yields of these are satisfactory. Vegetables and all farm crops

mature slightly earlier upon this soil than upon the slate soils. One of the essential requirements of this land is a liberal supply of organic matter and the growing of cover crops to prevent erosion.

In the following table is given the analyses of Granville sandy loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

	Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{4}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,600,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.02	.02	.85	.231	376	376	1600	4347
Subsoil }	.021	.036	.90	.163	1680	2880	7200	1304

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil-----	5.3	20.9	12.2	15.3	11.6	28.6	6.1
Subsoil-----	3.5	10.1	6.6	9.2	9.4	41.4	19.9

CONGAREE SILT LOAM.

The Congaree silt loam is the brown first bottom land of the county, embracing about 20,000 acres. It consists of a brown silt loam or loam having a depth of 8 to 12 inches. The subsoil is a light or yellowish-brown heavy compact silt loam, which may extend to a depth of 3 feet or more without any change or may show mottlings of gray or blue in the 3-foot section. The soil possesses a mellow smooth structure and when properly plowed and harrowed a good tilth is readily obtained. In the southwestern part of the county strips of fine sandy loam carrying small particles of mica are found. The Congaree silt loam represents the cream of the upland soils deposited along the streams and is one of the richest soils.

The widest and most continuous areas of this soil are developed along Stewarts, Goose, East and West Forks of Twelve-Mile, Waxhaw, Cane, Richardson, Lanes, Brown, and Crooked creeks. While this type usually lies several feet above the normal water level of the

streams, yet all of it is subject to overflow during freshets. Occasionally the crops are damaged or destroyed.

By straightening and deepening the natural drainage-ways and digging lateral ditches this land can for the most part be reclaimed and made very productive. It now yields from 20 to 50 bushels of corn per acre without any fertilizer. As a corn and grass soil it is held in high esteem.

In the following table is given the analyses of Congaree silt loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

	Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.098	.077	1.84	.424	1960	1540	36800	8480
Subsoil }	.065	.033	1.364	.264	5200	2640	109120	21120

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	0.0	0.2	0.4	4.4	10.1	70.3	14.7
Subsoil.....	0.0	0.1	0.4	3.8	9.5	65.5	20.7

WEHADKEE SILT LOAM.

This is a white or light gray land occurring in the first bottoms along the streams and has been washed down from the Alamance soils. The largest bodies lie along Brown Creek and near the headwaters of the Southfork or Crooked Creek. It overflows frequently and the natural drainage is poor. However, most of it can be reclaimed by open ditches.

The soil is a white to gray mellow silt loam underlain by a mottled yellow, gray, or brown silty clay loam or clay. The yields of corn are lower than upon the brown bottom-land (Congaree silt loam). The soil is naturally sour and is greatly benefited by the application of 1,000 to 2,000 pounds of lime per acre. This land should be mainly for pasturage, as Bermuda and other grasses do exceptionally well.

In the following table is given the analyses of Wehadkee silt loam type of soil and subsoil:

AVERAGE CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.087	.042	.767	.283	1740	840	15340	5640
Subsoil }	.041	.045	1.046	.152	3280	3600	83680	12160

AVERAGE MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	0.4	1.9	2.2	5.7	6.1	62.9	20.7
Subsoil.....	2.8	3.9	3.5	7.7	8.0	45.6	28.7

STORE OF PLANT FOOD IN SOILS OF THE COUNTY.

A chemical examination of the soils of the county have shown in a general way that phosphoric acid and nitrogen are the plant-food constituents contained in smallest amounts in most types. This has been the findings with reference to most of the soils occurring throughout the Piedmont region of the State.

The soils that show the largest amounts of nitrogen are Georgeville Slate Loam, Durham Sandy Loam, Alamance Slate Loam, Congaree Silt Loam, Wehadkee Silt Loam, Georgeville Gravelly Silt Loam, Alamance Silt Loam, Alamance Gravelly Loam, and Georgeville Silty Clay Loam. Those containing this constituent in smallest amounts at the present time are Durham Fine Sandy Loam, Granville Sandy Loam, Cecil Clay Loam, Cecil Fine Sandy Loam, Cecil Sandy Loam, Georgeville Silt Loam, and Iredell Loam types, in the order given.

Phosphoric acid is contained in largest amounts in Georgeville Slate Loam, Georgeville Silty Clay Loam, Alamance Slate Loam, Iredell Loam, Congaree Silt Loam, Alamance Gravelly Silt Loam, Georgeville Gravelly Silt Loam and Georgeville Silt Loam, and lowest with Durham Fine Sandy Loam, Cecil Fine Sandy Loam, Durham Sandy Loam, Granville Sandy Loam, Alamance Silt Loam, Cecil Sandy Loam, Wehadkee Silt Loam, and Cecil Clay Loam. With the exception of the Alamance Silt Loam type, the soils of the county that belong to the

Georgeville and the Alamance series are relatively high in phosphoric acid; particularly is this so with the Georgeville Slate Loam and the Georgeville Silty Clay Loam and the Alamance Slate Loam. The Iredell Loam, Congaree Silt Loam, and Alamance Gravelly Silt Loam are much higher in this constituent than are most Piedmont soils. Samples of the original slate that have been examined, from which the Georgeville and Alamance series have been formed, contain 0.151 per cent of phosphoric acid, 0.04 per cent nitrogen, 2.24 per cent potash, and 0.75 per cent lime (CaO).

In potash content the soils, as of other counties of the Piedmont section of the State examined, are relatively high as compared with most of the sandy soils of the eastern portion of the State. Those containing this constituent in the largest amounts are Georgeville Slate Loam, Congaree Silt Loam, Alamance Slate Loam, Georgeville Gravelly Silt Loam, Granville Sandy Loam, Wehadkee Silt Loam, Cecil Clay Loam, and Georgeville Silt Loam. Those containing the smallest amounts of this constituent of plant food are Durham Sandy Loam, Cecil Sandy Loam, Cecil Fine Sandy Loam, Iredell Loam, Alamance Gravelly Silt Loam, Georgeville Silt Clay Loam, Alamance Silt Loam, and Durham Fine Sandy Loam.

In lime (CaO) content the Iredell Loam is much higher than any of the other soils occurring in the county, it containing a little more than $2\frac{1}{2}$ per cent of this constituent, while the others range from 0.1272 in the Alamance Silt Loam to 0.424 in the Congaree Silt Loam and 0.75 in the pure slate from which the Alamance and Georgeville series of soils are largely formed. In addition to the Iredell Loam and Congaree Silt Loam, other soils containing lime in largest amounts are Alamance Gravelly Silt Loam, Alamance Slate Loam, Georgeville Silty Clay Loam, Wehadkee Silt Loam, Georgeville Silt Loam, and Georgeville Slate Loam. Those lowest in lime content are Durham Fine Sandy Loam, Alamance Silt Loam, Cecil Sandy Loam, Cecil Fine Sandy Loam, Cecil Clay Loam, Granville Sandy Loam, Durham Sandy Loam, and Georgeville Gravelly Silt Loam. It is believed the most of the lime in these soils is not in a form favorable for correcting of soil acidity.

WHAT EXPERIMENTS HAVE SHOWN TO BE THE CHIEF NEEDS OF THE SOILS.

The results of field experiments that have been conducted for a number of years in this county on the Alamance Silt Loam, in Gaston County on the Cecil Sandy Loam, in Mecklenburg County on Cecil Clay and Iredell Loam, and in Iredell County on Cecil Clay Loam have shown as an average of many trials that, generally speaking, nitrogen and phosphoric acid are the plant-food constituents chiefly needed by most of the types of soil, at least, occurring in the county.

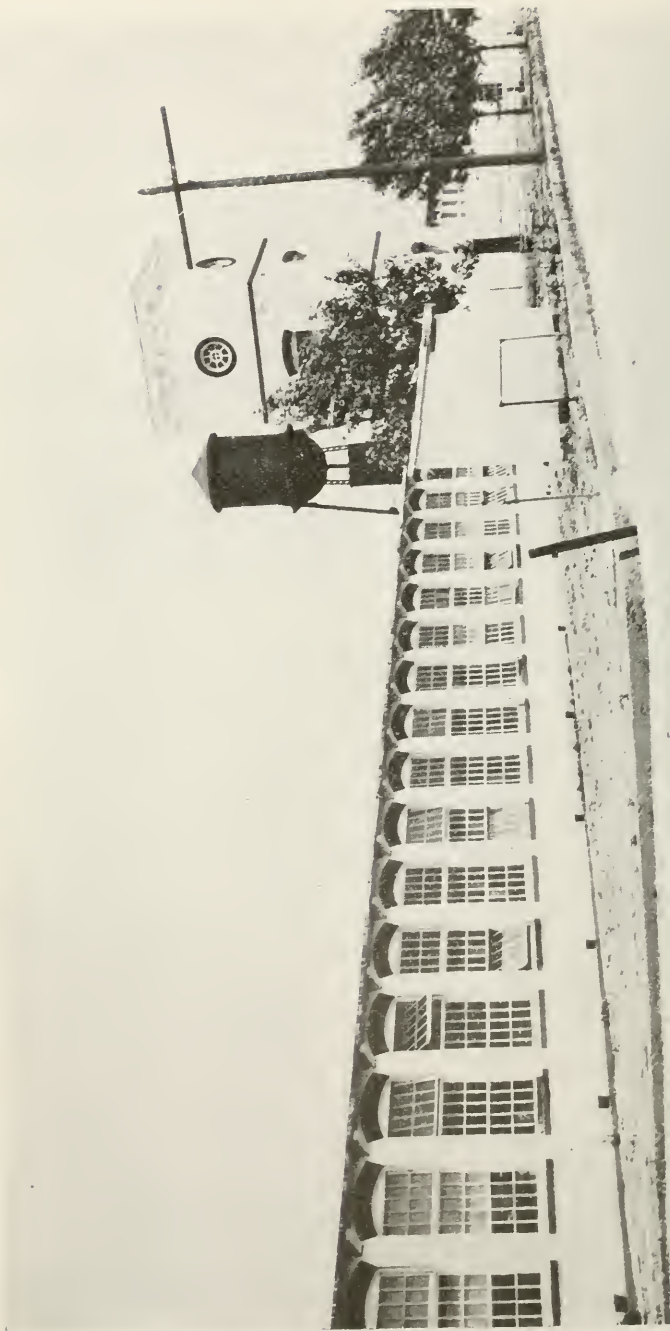


FIG. 6.—One of the cotton mills of the county.

Applications of potash have not generally been found to be absolutely essential for general crops, such as small grains, corn and cotton, to be assured of good yields. It is more probable that for such crops as tobacco, potatoes, and legumes applications of this constituent when prices are normal will prove more profitable; especially is this so when the soils are low in organic matter; notwithstanding, good crops might be grown without it. In experiments on the Alamance Silt Loam, near Monroe, fairly low in organic matter, it has been found that the use of potash when available at normal prices has increased the yields of mixtures of oat-and-vetch hay and seed cotton in sufficient amounts to justify its use. It is believed that with the organic-matter supply materially increased in this soil, as well as other types occurring in the county, the necessity for applications of potash may not be found to be so great in order to secure good returns.

The phosphoric-acid content in the Georgeville Silt Loam, Georgeville Silty Clay Loam, Alamance Slate Loam, Iredell Loam, Congaree Silt Loam, and the Alamance Gravelly Silt Loam is sufficiently high to lead to the belief that when these soils are handled in such a way as to embrace in them a considerable amount of organic matter the necessity for the use of applications of materials carrying phosphoric acid will not be so pressing; particularly is this so with the Georgeville Silty Clay Loam, and Alamance Slate Loam. In the experiments in Mecklenburg County on the Iredell Loam type of soil it was found that applications of phosphoric acid did not increase the yield at all. It is probable that because of the high content of phosphoric acid in this type in this county this same condition may exist with soils of the Iredell Loam type to a more or less extent.

Judging from the chemical analyses of the soils of the different types found in the county as well as from such other information as we have with reference to them, it is judged that in a general way, with the exceptions noted, nitrogen and phosphoric acid are the two controlling plant-food constituents in plant production. It will be seen, then, that the field results in a general way are borne out by chemical analyses of the soils. This is not always true, as has frequently been found the case with some of the eastern soils. The incorporation of organic matter, too, with practically all of the soils of the county low in organic matter is of the highest importance, as, generally speaking, the percentage of this material in the soils is relatively low. When leguminous crops and other cover crops are grown and plowed into the soil to increase the organic-matter supply already present it will be found, in all probability, in most cases that a fairly liberal use of lime will be essential for the largest and most profitable returns. Our experiments in this section indicate that lime is essential for best returns where a proper system of crop rotation is practiced and organic matter is constantly being plowed into the soil.

HOW TO SUPPLY PLANT-FOOD REQUIREMENTS.

For Nitrogen.—Soils that show a need for applications of nitrogen or ammonia can usually be considered as deficient in organic matter, and when the organic matter is high one can generally figure on the soil being relatively well supplied with this constituent.

Analyses and field results have shown that the soils of the county are generally low in nitrogen. One of the main problems, therefore, for the farmers is to supply this constituent in fairly liberal quantities to the soil, and do it as cheaply as possible. The chief means that must be used in supplying the nitrogen will be by the growing of suitable leguminous crops, properly inoculated, on the land and turning all or part of these into the soil. By such a plan not only would the supply of this constituent be increased, but the physical properties of the soil would be greatly improved by the addition of the organic matter to such an extent that baking would be greatly reduced after rains and plowing made easier and much more satisfactory.

Other materials that may be depended upon to supply the needs of the soils are farm manures and commercial fertilizers. The commercial materials that carry moderate or high percentages of nitrogen are usually expensive. It is frequently difficult to have low-priced products like corn pay as well for other than moderate applications of farm manures. Of course, when corn is selling at as high prices as it is at the present time much larger amounts, when properly used, may be added to an advantage. Where a crop like cotton is grown and the prices secured for the seed and lint are fair, or high, farmers will find, usually, the use of commercial forms of nitrogen in proper amounts may be used profitably, provided they are combined with other materials that will supply the other needs of the crop grown on any particular soil. Where grains and grasses are grown, mainly, other sources than the commercial ones will generally have to be depended upon to a large extent. Barnyard manure furnishes one of the most desirable sources of this constituent, as there are combined with it large amounts of organic matter and moderate amounts of phosphoric acid and potash. This material, however, is not very well balanced in the plant-food constituents it contains to meet the requirements of the soils of the county. It will, therefore, have to be supplemented by materials carrying the required fertilizing constituents needed by the soil, the chief of which are phosphoric acid and nitrogen. The nitrogen will be provided by the manure if it has been saved properly and the phosphoric acid by adding to it acid phosphate or some other commercial carrier of this constituent. As valuable as barnyard manure may be, it cannot be depended upon by farmers, generally, to keep up the organic matter and nitrogen supply of their soils, as the amount of manure produced on the farm is relatively small as compared with the acreage generally devoted to the growing of crops.

For Phosphoric Acid.—This constituent is generally low in the Durham, Granville, Cecil, and Wehadkee series of soils of the county. It is also low in the silt loam type of the Alamance series. The other types are fairly well provided potentially with this constituent.

With the farmer it is generally necessary, in order that his profits may be greatest, for him to use the source of phosphoric acid that is going to give him the highest net returns per acre. Taking everything into consideration, the two commercial forms that will largely have to be depended upon at the present time to supply phosphoric acid are acid phosphate and basic slag. Of course, there will be added to the soil a considerable amount of phosphoric acid when liberal amounts of manure, cotton-seed meal, and soybean meal, and ground bone used alone or in such materials as tankage and fish scrap, are added to the soil. Where large amounts of organic matter are being turned back into the soil in many cases it may be profitable to add finely ground phosphate rock at the time the material is being turned. The organic matter in rotting will tend to bring into available form some of the phosphoric acid contained in this material. Again, a plan that in many cases would appear to be practical would be to add this material to the manure in the stable as the manure is being formed, using the finely ground phosphate rock at the rate of 1 to 2 pounds per day broadcast over the manure, making the applications twice per week.

For Potash.—With soils of this county, as well as with Piedmont soils generally, the least important of the main plant-food constituents at the present time has been found to be potash. As a matter of fact, from the standpoint of potential plant food it would appear, even from this standpoint, that potash is of far less importance than is phosphoric acid and nitrogen. None of the soils contain less than 0.23 per cent, while the Congaree Silt Loam and the Georgeville Slate Loam contain over 1.8 per cent of this constituent. Speaking generally, the soils of the county contain enough potash in them for the growth of maximum crops for a goodly number of years to come, but it is not usually present apparently in large amounts in soluble form. It is generally with the soils of this county, as with most other Piedmont counties, more of a problem of making the supply present available than of increasing it by the addition of materials supplying this constituent; particularly is this so with the nonleguminous crops.

When the price of potash is as high as it is at the present time its use will not usually pay with ordinary crops such as corn, cotton, and small grains grown in the county.

For Lime.—When the main crops of the county, like corn, cotton, and small grains, are grown continuously on the land, as is frequently done, without the turning in of leguminous crops or the addition of organic matter in other ways, lime will not usually be found to be of primary necessity at the present time. However, when cover crops are used, as they should be, on all of the soils, especially on soils low in

organic matter, lime will generally be found to be essential for best yields and most profitable returns. Even with those soils high in calcium content like the Iredell Loam, it will no doubt prove beneficial in all cases to make applications of this constituent, as the lime contained in this type of soil is largely in the form of silicates, and does not act in this combination in the same beneficial way that lime in the form of ground limestone, shells, and marl does in neutralizing the acidity of the soil when applied and in making the soil sweet and more favorable for the growing of most leguminous and other crops. To build up the fertility of the soils of the county in the most substantial way from one to two tons of limestone or the equivalent of some other suitable form of lime per acre will have to be used every four to five years.

HOW TO SUPPLY ORGANIC MATTER IN SOILS.

By organic matter we mean the decaying residues of plant life such as roots, stems, and leaves, and the remains of animal life, such as insects and worms, in the soil. When soils are well supplied with such material, they are dark to black in color even when dry. Such soils are also fertile and productive when other factors, such as a good supply of plant food and drainage, are present naturally or supplied.

There are two practical ways to add organic matter to soils:

1. By growing and plowing under such crops as crimson, red and sweet clover, soy and velvet bean vines, including other crop residues, such as corn and cotton stalks, rye, grass and weeds.
2. By applying barnyard manure, or by allowing it to accumulate on pastured land.

In humid sections such as Union County, especially when cultivated crops are grown annually on the land, the decay of organic matter in the soil is very rapid, and in order to maintain the supply, all upland soils particularly should receive annually such material at the rate of at least two tons of air-dry material per acre.

Rye, weeds, cotton, and corn stalks, pine straw, woods-mould, and refuse from barnyards are valuable sources of organic matter; but legumes such as crimson, red, and sweet clover, soy and velvet bean vines, are more valuable, since they take nitrogen out of the air, and when plowed under increase the nitrogen supply of the soil, provided the soil is sweet and the legumes are well inoculated.

FERTILIZER MIXTURES TO USE FOR DIFFERENT CROPS.

For the average types of soil occurring in the county low in phosphoric acid it is recommended that for cotton 400 to 600 pounds of a mixture containing 10 to 12 per cent available phosphoric acid and $2\frac{1}{2}$ to 4 per cent ammonia be used. When the price of actual potash is not greater than 5 to 6 cents per pound it will in most cases prove profitable to use at least 2 per cent of this constituent. However, when

the price of potash is as high as it is at the present time it will not generally be found to pay with such crops as corn, cotton, and small grains, certainly not if a proper system of rotation of crops is used. A mixture that will give approximately the proportion indicated above is as follows:

Acid phosphate, 16 per cent.....	400 pounds
Cotton-seed meal, 7½ per cent.....	200 pounds
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Total	600 pounds

Dried blood, fish scrap, sulphate of ammonia, or nitrate of soda may be substituted for the cotton-seed meal in the mixture. In making the substitution it may be done by using 47 pounds of blood, 75 pounds of fish scrap, 30 pounds of sulphate of ammonia, or 42 pounds of nitrate of soda for every 100 pounds of cotton-seed meal in the mixture.

If especially desired on the more open sandier soils of the county one-third to one-half of the nitrogen may be put in at the time the crop is planted in the form of some organic combination such as cotton-seed meal, dried blood, or fish scrap, reserving the other half to two-thirds to be applied as a side dressing in the form of sulphate of ammonia or nitrate of soda about the first of July with crops planted in the spring. It is believed that materials carrying phosphoric acid and potash generally had best go on at the time the crop is planted.

For corn, small grains, grasses, and sorghum grown on the average soils of the county except those high in phosphoric acid, from 250 to 400 pounds per acre of a mixture containing 10 to 12 per cent available phosphoric acid and 5 to 6 per cent ammonia will give good returns. Where leguminous crops, stable manure, or other materials carrying organic matter fairly rich in nitrogen go back into the soil the amount of nitrogen in the mixture might be materially reduced one-third to one-half or more. Potash up to 1½ to 2 per cent in the mixture may be expected to pay when this constituent is selling at normal prices. A mixture that will give approximately the right quantities of nitrogen and phosphoric acid for average soils of the county, with exceptions noted, is as follows:

Acid phosphate, 16 per cent.....	200 pounds
Cotton-seed meal, 7½ per cent.....	200 pounds
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Total	400 pounds

Here, as above, the other recognized staple carriers of nitrogen may be substituted for the cotton-seed meal in the proportions indicated.

For clovers, cowpeas, soy beans, and other leguminous crops 300 pounds of 16 per cent acid phosphate per acre will usually be found satisfactory on soils containing a moderate amount of organic matter. This quantity may in many cases be increased to 500 pounds per acre

to good advantage. Potash-supplying materials can be used on most of the soils to good advantage when the price of this constituent is normal. We would not think it necessary to use more than 3 to 4 per cent of potash in the mixture for these crops even when potash is cheap.

In case the land is very poor or very low in organic matter, so that young plants do not start off well, a sufficient amount of cotton-seed meal, dried blood, or other nitrogen-furnishing material may be added which will supply nitrogen in the mixture up to 1 to 3 per cent. When 300 to 500 pounds of 16 per cent acid phosphate is used on such soils 50 to 75 pounds of cotton-seed meal or its equivalent in nitrogen content of dried blood or other suitable nitrogen carrier of this constituent may be used usually to good advantage. If it is discovered after the plants have gotten started that nitrogen is needed, as will be indicated by small, slow growth and pale, sickly appearance, the land being well drained, a top dressing of 50 to 75 pounds of nitrate of soda per acre may be applied when the plants are free from rain or dew. This will usually be found to be profitable.

With the high or moderately high phosphoric acid soils the amounts of phosphoric acid in the fertilizer mixture might in many cases be reduced. Especially would this be so when the organic-matter supply of these soils has been materially increased. This would especially be expected to be the case with the Georgeville Slate Loam, the Georgeville Silty Clay Loam, and the Alamance Slate Loam soils where the slate had thoroughly undergone disintegration.

With all the mixtures given above on the soils as the amount of organic matter turned back into the soil is increased, especially that from leguminous crops that are being grown on the land with the formation of nodules on their roots, the amounts of cotton-seed meal and other nitrogenous fertilizing materials required in the fertilizer mixtures to give most profitable returns may be materially reduced; in fact, when the supply has become liberal in the soil it might possibly be entirely left out of the fertilizer mixture in nitrogen-carrying material. It should be the aim of every farmer in the county, as nearly as practicable, to obtain this condition with his soils, for under normal conditions nitrogen is the constituent that is most expensive and the one that is most elusive and thereby easily lost from the soil when the conditions in the soil are not just right.

CROP ROTATION NECESSARY FOR A PERMANENT SYSTEM OF AGRICULTURE IN THE COUNTY.

It is the duty of every owner of farm lands in this county, as well as of other counties in the State, to follow methods of crop rotation and fertilization that shall at least maintain the producing power of the soils and build up those that are yielding only small returns at the present time. At the same time the treatment should be such as to give

good, substantial financial returns on the investment. The method in common use by the farmers should be such that their soils would become more productive from year to year. The investigations that have been conducted by the Division of Agronomy in previous years have been carried on primarily to determine the most economical methods of fertilizing the various soil types in this and other counties of the State and at the same time to take the information thus secured



FIG. 7.—A crop of wheat on the Georgeville silt loam type of soil.

and apply it in conjunction with systems of crop rotation found suited for different conditions for the purpose of helping the farmer increase the producing power of his soils. From information thus far secured we are able to recommend methods which if followed by the farmers of Union County will maintain their soils in a far more productive condition than they are at the present time when the methods that are in common practice are followed.

In providing the necessary plant-food constituents as recommended above for the different soils it is necessary to adopt, too, systems of crop rotation if the best and most profitable returns per acre are to be

secured. The following rotations are recommended as well adapted for conditions prevailing in the county:

First Year—Corn with soy beans and cowpeas drilled in the row at planting or before the first cultivation. They may be broadcasted just before the last cultivation if this is more desirable.

Second Year—Wheat or oats, followed by red clover, spring seeding.

Third Year—Red clover.

This is a very short rotation and is admirably adapted for use by the grain farmers of the county. It will be essential to use lime where red clover is seeded in order to be sure of success. The corn stover and wheat straw from such a rotation should be plowed in or be fed to stock and the manure carefully saved and returned to the soil. The soybeans or cowpeas and the last crop of red clover in the third year should be turned in to add to the organic matter and nitrogen supply of the soil. In starting this rotation on the average soils of the county use the fertilizer mixture given above for leguminous crops. If available, farm manure may be used with acid phosphate. In that case, if the application is fairly liberal the necessity for applying nitrogen in the fertilizer mixture will be materially reduced or entirely done away with. During the first year wheat or oats are grown on the land they should receive the treatment indicated above for corn. In addition to the acid phosphate, it would be well to apply 200 to 400 pounds of rock phosphate, as this fertilizer is for both the wheat and clover crop that is below. An application of 600 to 800 pounds of rock phosphate per acre to a good crop of red clover at the time or just before it is turned into the soil in the field might furnish much of the phosphoric acid required by the crops of the second period of the rotation. Within a comparatively short time enough nitrogen should be furnished by the soybeans or cowpeas, the clover and the roughage or stable manure, if the crops are good and the manure saved and applied back on the land or plowed directly into the soil after maturity. The application of rock phosphate and lime should be made every four to five years. Live-stock farming in connection with this rotation might help in improving the productivity of these soils if the manure is properly saved and applied back on the soil.

FOUR-YEAR ROTATIONS.

A good four-year rotation is the same as the above, with oats and soybeans or cowpeas following the corn the second year.

Other four-year rotations which could be adopted in this county are:

First Year—Corn.

Second Year—Crimson clover and cowpeas or soybeans.

Third Year—Wheat and oats, red clover.

Fourth Year—Red clover.

Or for sections of the county in which cotton is grown one similar to this might be used:

First Year—Corn.

Second Year—Wheat or oats, red clover.

Third Year—Red clover.

Fourth Year—Cotton, rye.

A similar method of fertilization should be adopted with these four-year rotations as is given for the three-year rotation.

FIVE- OR SIX-YEAR ROTATIONS.

Any of these rotations with two years of pasture added would make them even better adapted to live-stock farming. Where it is desired to grow cotton, the following six-year rotation should, under an intelligent supplemental system of fertilization and proper cultivation, give good results:

First Year—Corn, with cowpeas in the row or sown just before the last cultivation.

Second Year—Cotton, with rye sown broadcast in the cotton after the first picking and covered with a harrow or light cultivator.

Third Year—Rye plowed under, cowpeas, wheat or oats.

Fourth Year—Wheat or oats, red clover.

Fifth Year—Red clover.

The fertilizer here, too, would be similar to that indicated above for a three-year rotation.

LEAF TOBACCO SALES FOR JULY, 1917

Pounds sold for producers, first hand.....	3,473,313
Pounds sold for dealers.....	138,350
Pounds sold for warehouses.....	231,805
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Total	3,843,468

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FERTILIZER ANALYSES

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1917

ANALYSES OF COMMERCIAL FERTILIZERS—MAY 1, 1917, TO JULY 1, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
Brands claiming										
22304	American Agricultural Chemical Co., New York, N. Y.	Reese's Pacific Guano.	Mebane.	8.00	---	---	1.65	2.00	2.00	\$24.93
22275	do.	Zell's Special Compound for Tobacco	Ahoskie.	9.09	1.16	.48	1.64	1.99	1.87	24.98
22468	American Fertilizer Co., Norfolk, Va.	Bone and Peruvian Guano.	Fayetteville.	9.28	.64	.98	1.62	1.97	1.37	25.93
22174	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Durable Plant Food.	Elizabeth City.	7.72	.98	.74	1.72	2.09	2.24	26.14
22312	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Potomac Bone Special for Tobacco.	Burlington.	7.92	1.42	.18	1.60	1.94	2.68	28.04
22535	do.	Bryant's Special Fertilizer.	Lumberton.	8.62	.82	.74	1.56	1.89	1.92	24.77
22574	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 8-2-2.	Cove City.	8.18	1.18	.46	1.64	1.99	1.79	24.02
22425	Cooperative Warehouse Co., Salisbury, N. C.	Farmers' Union 8-2-2 Tobacco Guano, Standard Grade.	Wake Forest.	8.05	.62	1.10	1.72	2.09	2.02	25.37
22464	do.	do.	Ivanhoe.	8.30	.94	.66	1.60	1.94	2.10	25.52
22303	Craven Chemical Co., New Bern, N. C.	C. C. C. Tobacco Guano.	Enfield.	8.79	.38	1.10	1.48	1.80	1.94	24.71
22449	Georgia Chemical Works, Augusta, Ga.	XXX Meal Mixture.	St. Paul.	9.30	.56	1.00	1.56	1.89	1.64	24.05
22389	Greenville Oil and Fertilizer Co., Greenville, N. C.	Special Formula.	Spring Hope.	7.84	1.04	.60	1.64	1.99	1.33	21.38
22192	Imperial Company, Norfolk, Va.	Imperial Crop Grower.	Fayetteville.	7.90	1.12	.58	1.70	2.07	1.82	24.14
22346	do.	Imperial Tobacco Guano.	Red Springs.	8.56	1.06	.60	1.66	2.02	1.84	24.73
22308	Miller Fertilizer Co., Baltimore, Md.	Ammoniated Dissolved Bone.	Siler City.	7.62	.92	.62	1.54	1.87	2.08	24.49
22341	Norfolk Fertilizer Co., Norfolk, Va.	Oriana Crop Grower.	Fayetteville.	7.97	1.16	.76	1.92	2.33	1.91	25.58
22358	N. C. Farmers' Union, Statesville, N. C.	N. C. Farmers' Union 8-2-2 Tobacco Guano.	Trenton.	9.17	1.38	.46	1.84	2.24	1.76	25.70
22580	do.	do.	do.	9.72	1.24	.44	1.68	2.04	2.02	26.88
22581	do.	do.	do.	7.66	1.28	.44	1.72	2.09	2.08	27.28
22582	do.	do.	do.	10.47	1.22	.42	1.64	1.99	1.94	27.06

2584	.....do.....	do.....	9.65	1.38	.46	1.84	2.24	2.05	27.63
2307	Ober, G., & Sons Co., Baltimore, Md.....	Ober's Standard Tobacco Fertilizer.....	8.05	1.14	.68	1.82	2.21	2.29	27.14
2355	Palmetto Guano Corporation, Columbia, S. C.....	Palmetto Special Fertilizer.....	8.72	1.04	.64	1.68	2.04	1.62	23.88
2352	Pocomoke Guano Co., Norfolk, Va.....	Pocomoke Guano.....	8.43	1.04	.58	1.62	1.97	1.88	24.63
2188	Robertson Fertilizer Co., Norfolk, Va.....	Double Dollar Tobacco Guano.....	7.91	1.22	.48	1.70	2.07	1.59	23.00
2554	Southern Cotton Oil Co., Fayetteville, N. C.....	Fayetteville Oil Mill Standard C. S. M.....	7.90	.74	.80	1.54	1.87	1.54	22.11
2490	Southern Cotton Oil Co., Shelby, N. C.....	S. C. O. Co. Ammoniated.....	8.32	.68	.94	1.62	1.97	2.57	27.97
2210	Tennessee Chemical Co., Greensboro, N. C.....	Ox Fertilizer, 8-2-2.....	7.98	.62	1.08	1.70	2.07	1.80	24.12
2363	Tuscarora Fertilizer Co., Greensboro, N. C.....	Tuscarora Standard.....	8.18	1.08	.46	1.54	1.87	1.68	23.05
2734	.....do.....	Standard Tobacco Guano.....	8.25	.80	.82	1.62	1.97	1.93	24.70
2645	Va.-Car. Chemical Co., Richmond, Va.....	Durlam Fertilizer Progressive Farmer Guano.....	8.50	.52	1.16	1.68	2.04	2.42	27.66
2060	.....do.....	Stonewall Tobacco Guano.....	9.62	.90	.60	1.50	1.82	1.84	25.12
274	.....do.....	Va.-Car. Chemical Co.'s A. J. A. and C. S. M. Guano.....	7.51	1.16	.74	1.90	2.31	1.66	23.79
2300	Brand claiming	Peruvian Guano Corporation, Charleston, S. C.....	8.00	.....	.....	1.65	2.00	4.00	34.93
2444	Brand claiming	Atlantic Tobacco Compound.....	8.64	1.30	.22	1.52	1.85	3.91	34.57
2232	Brands claiming	Wizard Crop Grower.....	8.00	.....	.....	2.06	2.50	2.00	26.65
2603	American Fertilizer Co., Norfolk, Va.....	Kenly.....	8.22	1.28	.80	2.08	2.53	1.84	26.16
2598	Bowker Fertilizer Co., New York, N. Y.....	Tunis.....	8.00	.....	.....	2.47	3.00	1.00	23.37
2617	Coe-Mortimer Co., Charleston, S. C.....	Walstonburg.....	7.89	1.56	1.20	2.76	3.36	1.34	26.19
2681	Grandy, N. G., & Co., Elizabeth City, N. C.....	with Potash.....	8.94	1.50	.84	2.34	2.84	.57	21.62
2682	Navassa Guano Co., Wilmington, N. C.....	Coe-Mortimer Co.'s Fertilizer.....	8.22	1.80	.76	2.56	3.11	.98	23.87
2719	Powhatan Chemical Co., Richmond, Va.....	Grandy's 3-8-1 Fertilizer.....	9.26	2.88	.16	3.04	3.70	.85	26.28
2382	Rasin-Monumental Co., Baltimore, Md.....	White Oak.....	8.28	1.20	1.32	2.52	3.06	1.12	24.46
2253	Robeson Mfg. Co., Lumberton, N. C.....	Navassa Cotton-seed Meal Special Guano.....	9.05	1.70	.70	2.40	2.92	1.04	24.33
2733	Tuscarora Fertilizer Co., Greensboro, N. C.....	do.....	7.67	1.26	1.50	2.76	3.36	.94	23.96
2607	Brands claiming	Husler Tobacco Special.....	8.72	1.74	.28	2.02	2.46	1.27	23.55
2481	American Agricultural Chemical Co., New York, N. Y.....	Rasin Indian Brand for Tobacco.....	8.18	1.48	1.94	3.42	4.16	1.24	28.74
2604	Baugh & Sons, Norfolk, Va.....	R. M. C. 8-3-1.....	8.15	1.44	1.30	2.74	3.33	.99	24.61
2576	Bowker Fertilizer Co., New York, N. Y.....	Tuscarora Fertilizer, No. 831.....	8.00	.....	.....	2.47	3.00	2.00	28.88
2576	Brown, H. P., Guano Co., Salisbury, N. C.....	Lazaretto Special Tobacco and Potato Fertilizer.....	8.24	1.46	.94	2.40	2.92	1.90	27.82
2832	Coöperative Warehouse Co., Salisbury, N. C.....	Baugh's High Grade Tobacco Grower.....	8.10	1.74	.66	2.40	2.92	2.14	28.88
		Bowker Tobacco Fertilizer.....	8.37	1.68	.70	2.38	2.89	1.69	26.82
		Brown's 8-3-2.....	7.58	1.42	.88	2.30	2.80	1.83	26.39
		Farmers' Union 8-3-2 Tobacco Guano, High Grade.....	7.27	.68	1.36	2.04	2.48	1.92	25.44

ANALYSES OF COMMERCIAL FERTILIZERS—MAY 1, 1917, TO JULY 1, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
Brands claiming										
2478	Craven Chemical Co., New Bern, N. C.	C. C. Co.'s Tobacco Special	Grifton	8.00	1.56	1.10	2.47	3.00	2.00	\$28.88
2219	Farmville Oil and Fertilizer Co., Farmville, N. C.	8-3-2 Special Formula for Tobacco	Farmville	8.24	1.00	1.56	2.56	3.11	1.90	28.49
2326	Georgia Chemical Works, Augusta, Ga.	Georgia Tobacco Special Revised	Cove City	9.05	1.70	.60	2.30	2.80	2.28	30.11
2510	do.	do.	do.	8.17	1.82	.42	2.24	2.72	1.99	27.53
2523	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Gold Leaf Grower	do.	7.02	1.34	1.10	2.44	2.97	1.73	25.92
2399	Miller Fertilizer Co., Baltimore, Md.	Miller Standard	Point Harbor	8.09	1.68	.62	2.30	2.80	1.90	27.05
2180	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Special Tobacco Grower	Fort Barnwell	9.08	.90	1.72	2.62	3.19	1.80	29.08
2217	do.	Superb Tobacco Grower C. S. M.	Snow Hill	7.87	.36	2.32	2.68	3.26	2.18	30.03
2268	Ober, G., & Sons Co., Baltimore, Md.	Ober's Spear Head Tobacco Guano	Ahoskie	8.37	1.58	1.10	2.64	3.21	2.11	30.01
2386	Palmetto Guano Corporation, Columbia, S. C.	Palmetto Ammoniated Guano	Spring Hope	7.77	1.80	.74	2.54	3.09	2.00	28.44
2577	Pocomoke Guano Co., Norfolk, Va.	Monarch Tobacco Special	Trenton	8.46	1.72	.64	2.36	2.87	2.05	28.62
2446	Robeson Mfg. Co., Lumberton, N. C.	Tobacco Special	St. Paul	8.01	.80	1.62	2.42	2.94	1.69	26.62
2407	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Delta Fertilizer	Cove City	8.04	1.72	.74	2.46	2.99	2.22	29.47
2499	do.	do.	do.	8.17	1.88	.72	2.60	3.16	1.89	28.54
2503	do.	do.	do.	8.27	1.70	.74	2.40	2.92	2.06	28.81
2515	do.	do.	do.	8.20	1.74	.78	2.52	3.06	1.99	28.73
2134	Swift & Co Fertilizer Works, Atlanta, Ga.	Swift's Special Tobacco Grower	Robersonville	8.01	1.26	1.08	2.34	2.84	1.88	27.24
2350	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Bright Leaf Tobacco Grower, Rev sed.	Trenton	8.54	1.68	.58	2.26	2.75	2.06	28.23
2470	do.	V.-C. C. Co.'s Bright Leaf Tobacco Grower.	Grifton	8.59	1.52	1.18	2.70	3.28	2.00	29.93
Brands claiming										
2245	Armour Fertilizer Works, Greensboro, N. C.	Armour's No. 833 Fertilizer	Patterson Springs	8.00	---	---	2.47	3.00	3.00	33.37
				8.15	1.38	.98	2.36	2.87	3.01	33.11

2833	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 8-3-3 Tobacco Guano	7.97	.56	1.54	2.10	2.55	2.3	23.94
2426	do	do	8.01	.82	1.40	2.22	2.70	2.90	31.83
2722	Farmers Cotton Oil Co., Wilson, N. C.	Golden Gem	7.68	1.14	1.02	2.16	2.63	3.21	32.80
2353	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Lenoir Bright Leaf Tobacco Grower	7.57	.90	1.86	2.76	3.36	2.88	33.56
2357	N. C. Farmers' Union, Statesville N. C.	N. C. Farmers Union 8-3-3 Tobacco Guano	8.51	2.24	.34	2.58	3.14	1.89	29.20
2360	do	do	9.05	2.06	.36	2.42	2.94	2.47	31.56
2370	Pamlico Chemical Co., Washington, N. C.	Pamlico Sweet Potato Guano	8.02	1.28	1.10	2.38	2.89	3.20	34.02
2260	Pearsall & Co., Wilmington, N. C.	Pearsall's High Grade Guano	7.02	1.14	.98	2.12	2.58	3.02	35.22
2269	Peruvian Guano Corporation, Charleston, S. C.	Peruvian Mixture	8.35	1.28	.30	1.58	1.92	4.19	35.94
2301	Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.	Tar River Special	8.94	.98	1.32	2.30	2.80	2.52	31.20
2371	Pocomoke Guano Co., Norfolk, Va.	Harvey's High Grade Monarch	7.92	1.72	.58	2.30	2.80	2.46	29.88
320	Union Guano Co., Winston, N. C.	Victoria High Grade Tobacco Guano	8.08	1.52	1.02	2.54	3.09	3.79	37.70
Brands claiming			8.00			3.29	4.00	1.00	26.82
2441	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Special Fertilizer	8.02	2.22	.70	2.92	3.55	1.02	25.38
2978	Union Seed and Fertilizer Co., Wilmington, N. C.	U. S. and F. Co.'s Brand No. 15	8.85	.50	2.66	3.16	3.84	.79	26.07
2979	do	do	8.97	.56	2.54	3.10	3.77	.97	26.84
2980	do	do	9.07	.42	2.56	2.98	3.62	.88	25.99
2981	do	do	8.31	.68	2.52	3.20	3.89	1.03	26.90
2378	do	Spring Hope	8.81	.60	2.66	3.26	3.96	.90	27.00
Brands claiming			8.00			3.29	4.00	2.00	31.82
2276	American Agricultural Chemical Co., New York, N. Y.	Bradley's Sea Fowl Guano	9.39	2.00	.54	2.54	3.09	1.96	30.36
2323	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Ideal Compound	7.29	2.16	.98	3.14	3.82	1.91	30.03
2375	do	do	7.82	2.30	.94	3.24	3.94	1.95	31.18
2384	Palmetto Guano Corporation, Columbia, S. C.	Palmetto Tobacco Guano, 1917	7.43	2.62	.82	3.44	4.18	1.90	31.38
2489	Southern Cotton Oil Co., Shelby, N. C.	S. C. O. Co. Ammoniated	9.04	1.22	1.84	3.06	3.72	2.44	34.09
2395	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's for All Crops Trade Mark 8-4-2 Guano	7.50	2.10	1.12	3.22	3.91	1.94	30.72
2303	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Special Revised	8.02	2.20	.34	2.54	3.09	3.78	37.59
Brand claiming			8.00			4.11	5.00	2.00	35.26
2393	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's Trade Mark Fertilizer for All Crops, 8-5-2 Guano	7.87	2.68	1.42	4.10	4.98	1.79	34.04
Brand claiming			9.00			1.65	2.00	3.00	30.93
2365	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Viking Ammoniated Guano	9.12	.98	.64	1.62	1.97	3.20	31.92

ANALYSES OF COMMERCIAL FERTILIZERS—MAY 1, 1917, TO JULY 1, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
Brand claiming				9.00	---	---	1.65	2.00	2.00	25.93
2306	Poachontas Guano Co., Lynchburg, Va.	Yellow Tobacco	Mebane	9.12	1.14	.54	1.68	2.04	1.70	24.68
Brands claiming				9.00	---	---	2.26	2.75	2.00	28.49
2388	Greenville Oil and Fertilizer Co., Greenville, N. C.	Special Meal Mixture	Spring Hope	9.07	.92	1.34	2.26	2.75	1.93	28.21
2383	Rasin-Monumental Co., Baltimore, Md.	Rasin Dixie Tobacco Guano	Nashville	9.52	.86	1.26	2.12	2.58	2.32	30.02
2380	Union Guano Co., Winston-Salem, N. C.	Union Perfect Cotton Grower	Elm City	9.06	.60	1.74	2.34	2.84	2.12	29.49
Brands claiming				9.00	---	---	1.65	2.00	1.00	20.93
2485	American Agricultural Chemical Co., New York, N. Y.	Canton Chemical Fish Mixture	Murfreesboro	9.32	.62	.86	1.48	1.80	1.01	20.59
2610	do.	Detrick's Ammoniated Superphosphate with Potash.	Wilcox	9.06	1.18	.52	1.70	2.07	1.11	21.75
2243	Navassa Guano Co., Wilmington, N. C.	Navassa Complete Fertilizer	Lawndale	10.49	.94	.72	1.66	2.02	.74	21.16
2209	Tennessee Chemical Co., Greensboro, N. C.	Ox Fertilizer 9-2-1	Mount Airy	8.47	.54	1.08	1.62	1.97	1.08	20.67
Brands claiming				9.00	---	---	2.47	3.00	1.00	24.37
2467	American Agricultural Chemical Co., New York, N. Y.	Detrick's Kangaroo Complete Kom-pound.	St. Paul	9.59	1.12	1.40	2.52	3.06	1.03	25.32
2452	do.	do.	do.	9.67	1.42	1.18	2.60	3.16	1.12	26.19
2170	Farmers Guano Co., Norfolk, Va.	Farmers Trade Mark F. G. C. 9-3-1 Guano.	South Mills	8.44	1.54	1.02	2.56	3.11	1.15	24.94
2616	Grandy, N. G., & Co., Elizabeth City, N. C.	Grandy's 3-9-1 Fertilizer	Elizabeth City	10.49	2.84	.24	3.08	3.74	.98	28.33
Brand claiming				9.00	---	---	2.26	2.75	.50	21.03
2377	Union Seed and Fertilizer Co., Wilmington, N. C.	U. S. and F. Co.'s Brand No. 3	Nashville	9.89	.68	1.38	2.06	2.50	.50	21.04
Brand claiming				9.00	---	---	2.47	3.00	.50	21.87
1527	Union Seed and Fertilizer Co., Wilmington, N. C.	U. S. and F. Co.'s Brand No. 4	Kerr	10.04	2.20	.10	2.30	2.80	.55	22.45

2600	Brand claiming Powhatan Chemical Co., Richmond, Va.....	Special Fertilizer.....	Wilson.....	10.00 10.15	2.47 1.30	3.00 2.87	1.00 1.00	25.37 25.06
2366	Brand claiming Rock Hill Fertilizer Co., Rock Hill, S. C.....	Piedmont High Grade Fertilizer.....	Pineville.....	10.00 10.59	1.65 1.46	2.00 2.07	3.00 3.12	31.93 33.33
2538	Brand claiming Acme Mfg. Co., Wilmington, N. C.....	Acme 3-9-0 Top Dresser.....	Lumberton.....	3.00 3.32	9.00 6.04	7.40 6.92	9.00 8.41	34.08 32.38
2257	Brands claiming Acme Mfg. Co., Wilmington, N. C.....	Acme 6-4-0 Special Fertilizer.....	Hope Mills.....	6.00 6.19	3.29 1.62	4.00 3.12	4.00 3.79	19.82 19.29
2263	do.....	do.....	do.....	5.88 5.88	1.52 1.60	3.12 3.12	3.79 3.79	18.98 18.98
2456	do.....	do.....	Lena.....	6.62 7.03	1.64 1.92	1.22 1.22	2.86 3.14	3.48 3.82
2564	do.....	do.....	Fayetteville.....	7.03 6.52	1.92 1.12	1.22 1.44	3.14 2.56	20.22 3.11
2674	do.....	do.....	Nashville.....	6.52 6.37	1.12 2.24	1.44 3.02	3.11 3.67	17.27 19.05
2256	American Agricultural Chemical Co., New York, N. Y.....	Carolina Formula.....	Hope Mills.....	6.37 6.60	2.24 1.72	3.02 2.98	3.67 3.62	19.05 19.12
2689	do.....	do.....	White Oak.....	6.60 6.44	1.72 2.90	2.98 3.42	3.62 4.16	19.12 20.80
2537	American Fertilizer Co., Norfolk, Va.....	American 6 and 4 Ammoniated Com-pound.....	Parkton.....	6.44 6.10	2.90 1.38	3.42 2.92	4.16 3.55	20.80 18.36
2560	Armour Fertilizer Works, Wilmington, N. C.....	Armour's Ammoniated Superphosphate.....	Fayetteville.....	6.10 5.53	1.38 2.14	2.92 3.32	3.55 4.04	18.36 19.47
2432	do.....	do.....	Lena.....	5.53 7.32	2.14 2.50	3.32 3.24	4.04 3.94	19.47 20.93
2686	Bowker Fertilizer Co., New York, N. Y.....	Bowker 4-6-0 Fertilizer.....	White Oak.....	7.32 5.80	2.50 1.48	3.24 2.96	3.94 3.60	20.93 18.23
2347	Cooperative Warehouse Co., Salisbury, N. C.....	Farmers' Union 6-4-0 Ammoniated Com-pound.....	Red Springs.....	5.80 6.02	1.48 2.24	2.96 3.12	3.60 3.79	18.23 19.12
2345	Imperial Company, Norfolk, Va.....	Imperial 4-6-0 Fertilizer.....	do.....	6.02 7.30	2.24 1.00	3.12 3.20	3.79 3.89	19.12 20.74
2534	do.....	do.....	Parkton.....	7.30 6.38	1.00 2.12	3.20 2.84	3.89 3.45	20.74 18.31
2287	Norfolk Fertilizing Co., Norfolk, Va.....	Oriana 4-6-0 Fertilizer.....	Red Springs.....	6.38 6.70	2.12 2.42	2.84 3.22	3.45 3.91	18.31 20.32
2286	do.....	do.....	do.....	6.70 7.14	2.42 1.70	3.22 3.10	3.91 3.77	20.32 20.16
2344	do.....	do.....	Fayetteville.....	7.14 5.82	1.70 2.40	3.10 3.10	3.77 3.77	20.16 18.84
2254	Pamlico Chemical Co., Washington, N. C.....	Pamlico Fish Compound.....	Hope Mills.....	5.82 5.99	2.40 2.30	3.10 3.26	3.77 3.96	18.84 19.68
2463	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Flagstaff Ammoniated Phos-phate.....	Fayetteville.....	5.99 6.92	2.30 1.70	3.26 3.46	3.96 4.21	19.68 21.45
2458	Tuscarora Fertilizer Co., Wilmington, N. C.....	Tuscarora Ammoniated Superphosphate.....	Stedman.....	6.92 7.00	1.70 1.11	3.46 5.00	4.21 5.00	21.45 24.26
2697	Brand claiming Acme Mfg. Co., Wilmington, N. C.....	Acme 7-5-0 Fertilizer.....	Tar Heel.....	7.00 7.65	4.11 2.26	5.00 3.46	5.00 4.21	24.26 22.18
2405	Brand claiming Scotland Neck Guano Co., Scotland Neck,	Biggs' 8-3-0.....	Cove City.....	8.00 8.37	2.47 1.42	3.00 2.58	3.00 3.14	18.37 19.21
2455	Brands claiming Acme Mfg. Co., Wilmington, N. C.....	Acme 8-4-0 Special Fertilizer.....	Lena.....	8.00 8.09	1.16 1.98	2.58 2.76	3.14 3.36	21.82 19.68
2436	do.....	do.....	do.....	8.09 7.13	1.98 1.80	2.76 3.34	3.36 4.06	19.68 21.16

ANALYSES OF COMMERCIAL FERTILIZERS—MAY 1, 1917, TO JULY 1, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory	
				Available Phosphate Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash		
Brands claiming											
2274	American Agricultural Chemical Co., New York, N. Y.	Ammoniated Fertilizer	Ahoscie	8.06	2.38	1.02	3.29	4.00	---	\$21.82	
2348	American Fertilizing Co., Norfolk, Va.	American Brand 4 Ammonia Compound	Fayetteville	8.84	2.08	.82	2.90	3.53	---	21.02	
2349	Armour Fertilizer Works, Wilmington, N. C.	Armour's Ammoniated Superphosphate	do	8.36	1.70	1.44	3.14	3.82	---	21.55	
2536	do	do	Parkton	8.62	1.66	1.46	3.12	3.79	---	21.72	
2486	Arps, George L., & Co., Norfolk, Va.	Arps' Quickstep Brand	Rich Square	7.92	2.28	.96	3.24	3.94	---	21.53	
2264	Atlantic Chemical Corporation, Norfolk, Va.	Atlantic Seco Ammoniated	Ahoscie	7.91	2.22	.80	3.02	3.67	---	20.59	
2556	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Nitrophosphate Soil and Crop Fertilizer	Fayetteville	8.28	2.52	.66	3.18	3.87	---	21.74	
2480	do	do	Grifton	8.20	2.34	.86	3.20	3.89	---	21.64	
2043	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 8-4 Ammoniated Phosphate	Fayetteville	8.39	.98	2.26	3.24	3.94	---	22.00	
2440	Conestee Chemical Co., Wilmington, N. C.	Conestee 8-4-0 Special Fertilizer	Kenly	7.37	2.36	.98	3.34	4.06	---	21.40	
2328	Contentnea Guano Co., Wilson, N. C.	Climax Cotton Grower	Cove City	8.35	1.74	1.42	3.16	3.84	---	21.62	
2325	Georgia Chemical Works, Atlanta, Ga.	Georgia Special 8-4-0 Superphosphate	do	8.67	2.78	.46	3.24	3.94	---	22.28	
2327	do	do	do	8.39	2.92	.40	3.32	4.04	---	22.33	
2508	do	do	do	8.56	2.64	.16	2.80	3.40	---	20.32	
2524	do	do	do	10.57	1.16	1.12	2.28	2.77	---	20.05	
2525	do	do	do	8.58	2.84	.32	3.16	3.84	---	21.85	
2573	do	do	do	9.19	1.72	.92	2.64	3.21	---	20.28	
2269	Hampton Guano Co., Norfolk, Va.	Hampton 4-8-0 Fertilizer	Ahoscie	8.60	1.96	.94	2.90	3.53	---	20.78	
2302	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's 8-4-0 Fertilizer	Halifax	8.42	2.10	.90	3.00	3.65	---	21.02	
2533	Imperial Company, Norfolk, Va.	Imperial 4-8-0 Fertilizer	Park	8.05	2.06	1.12	3.18	3.87	---	21.40	
2093	do	do	do	7.87	2.60	.84	3.24	3.94	---	21.48	
2316	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Ideal Special Tobacco	Cove City	7.70	1.48	1.72	3.20	3.89	---	21.14	

2317	do	do	do	7.74	1.42	1.66	3.08	3.74	20.68
2318	do	do	do	7.69	1.52	1.70	3.22	3.91	21.21
2319	do	do	do	7.46	1.48	1.74	3.22	3.91	20.98
2320	do	do	do	9.52	1.18	1.66	2.84	3.45	21.45
2321	do	do	do	7.96	1.44	1.30	2.74	3.33	19.37
2322	do	do	do	7.66	1.36	1.48	2.84	3.45	19.59
2324	do	do	do	7.42	1.52	1.72	3.24	3.94	21.03
2409	do	do	do	8.05	1.34	1.86	3.20	3.89	21.49
2411	do	do	do	7.38	1.70	1.32	3.02	3.67	20.06
2414	do	do	do	7.40	1.38	1.50	2.88	3.50	19.50
2506	do	do	do	7.94	1.56	1.54	3.10	3.77	20.96
2519	do	do	do	7.70	1.32	1.52	2.84	3.45	19.63
2520	do	do	do	7.89	1.48	1.24	2.72	3.31	19.31
2567	do	do	do	8.12	1.42	1.12	2.54	3.09	18.79
2569	do	do	do	8.46	1.46	1.00	2.46	2.99	18.79
2570	do	do	do	9.55	2.50	.50	3.00	3.65	22.15
2642	McNair Phosphate Co., Laurinburg, N. C.	8-4 Ammoniated	Wakulla	9.00	1.82	.76	2.58	3.14	19.84
2683	Navassa Guano Co., Wilmington, N. C.	Navassa High Grade Ammoniated Superphate.	Lena	9.05	2.36	.78	3.14	3.82	22.84
2355	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Standard Crop Grower	Trent	8.29	1.08	2.04	3.12	3.79	21.39
2343	Norfolk Fertilizing Co., Norfolk, Va.	Oriana 4-8-0 Fertilizer	Fayetteville	8.06	1.90	1.22	3.12	3.79	21.16
2405	N. C. Farmers' Union, Statesville, N. C.	N. C. Farmers' Union Guano No. 8-4-0	Lawndale	9.15	1.66	.94	2.60	3.16	20.07
2583	do	N. C. Farmers' Union Tobacco Guano	Trenton	8.67	2.62	.22	2.84	3.45	20.60
2579	do	N. C. Farmers' Union 8-4-0 Superphosphate.	do	8.72	2.78	.24	3.02	3.67	21.40
2266	Old Buck Guano Co., Richmond, Va.	Old Buck 4 Per Cent Compound	Ahoskie	7.96	2.44	.90	3.34	4.06	21.99
2339	Pearsall & Co., Wilmington, N. C.	Pearsall's Bone Meal and Fish Guano	Red Springs	7.95	.24	2.60	2.84	3.45	19.86
2340	do	do	do	8.40	1.00	2.02	3.02	3.67	21.08
2233	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Special Fertilizer	Sunbury	8.03	2.04	1.08	3.12	3.81	21.13
2421	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Special Mixture	Lilesville	8.01	1.80	1.56	3.36	4.09	22.12
2248	Robinson Mfg. Co., Lumberton, N. C.	R. M. C. 8-4	Hope Mills	7.42	1.36	1.66	3.02	3.67	20.10
2252	do	do	do	8.04	1.44	1.32	2.76	3.36	19.63
2445	do	do	do	7.97	1.76	1.44	3.20	3.89	21.41
2445	do	do	St. Paul	8.06	2.56	1.00	3.16	3.84	21.33
2396	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Defender Ammoniated Phosphate	Aydlett	7.79	2.16	.94	3.10	3.77	20.81

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MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	
	Brands claiming								
2314	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Defender Ammoniated Phosphate	Cove City	8.00			3.29	4.00	\$21.82
2406	do.	do.	do.	8.00	2.32	1.08	3.40	4.13	22.28
2408	do.	do.	do.	7.89	2.28	1.08	3.36	4.09	22.00
2498	do.	do.	do.	7.87	2.42	1.02	3.44	4.18	22.32
2502	do.	do.	do.	8.14	2.38	.98	3.36	4.09	22.25
2504	do.	do.	do.	7.87	2.32	.82	3.14	3.82	21.06
2505	do.	do.	do.	8.03	2.22	.78	3.00	3.65	20.63
2513	do.	do.	do.	8.05	2.32	.80	3.12	3.79	21.15
2514	do.	do.	do.	8.00	2.32	.96	3.28	3.99	21.78
2516	do.	do.	do.	8.14	2.06	1.12	3.18	3.87	21.50
2330	do.	do.	do.	8.06	2.30	.98	3.28	3.99	21.84
2336	do.	do.	Fayetteville	7.99	2.58	.88	3.46	4.21	23.52
2402	do.	do.	do.	8.24	2.58	1.00	3.58	4.35	23.28
2419	do.	do.	do.	8.02	2.42	.94	3.36	4.09	22.13
2429	Southern Cotton Oil Co., Fayetteville, N. C.	Secco Ammoniated Compound	Lilesville	8.30	2.28	1.00	3.23	3.99	22.08
2677	do.	do.	do.	8.53	1.96	1.12	3.03	3.74	21.47
2556	do.	do.	do.	7.95	1.54	1.00	2.54	3.09	18.62
2558	do.	do.	Fayetteville	7.81	1.52	1.16	2.68	3.26	19.07
2555	do.	do.	do.	7.74	1.66	1.22	2.68	3.26	19.00
2428	do.	do.	do.	7.87	1.70	1.10	2.80	3.40	19.63
2678	do.	do.	Hope Mills	8.02	2.10	1.00	3.10	3.77	21.04
2690	do.	do.	Lena	7.82	1.80	1.08	2.88	3.50	19.92
2437	do.	do.	White Oak	7.85	1.92	1.06	2.98	3.62	20.37
	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Ammoniated Phosphate	do.	8.20	1.88	1.36	3.24	3.94	21.81
			Lucama						

2675	Union Guano Co., Winston-Salem, N. C.	Union Special 8-4-0 Superphosphate.	White Oak.	8.43	2.30	.42	2.72	3.31	19.85
305	Union Seed and Fertilizer Co., Wilmington, N. C.	U. S. and F. Co. Brand No. 13.	Chadbourn.	7.96	1.66	1.16	2.82	3.43	19.80
2483	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's 8-4 Ammoniated Phosphate.	Murfreesboro.	8.69	2.34	1.02	3.26	3.96	22.80
Brands claiming									
2403	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Soil and Crop Fertilizer.	Elizabeth City.	8.00			4.11	5.00	25.26
2400	Farmers Guano Co., Norfolk, Va.	Farmers' Trade Mark F. G. C. 8-5 Ammoniated Phosphate.	Poplar Branch.	8.25	3.26	.80	4.06	4.94	25.30
				8.22	2.52	1.52	4.04	4.91	25.19
2417	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Lobos Tobacco Grower.	Cove City.	7.85	2.40	1.66	4.06	4.94	24.90
2413	do.	do.	do.	7.65	2.22	1.66	3.88	4.72	23.96
2418	do.	do.	do.	7.84	2.42	1.34	3.76	4.57	23.63
2518	do.	do.	do.	7.69	1.48	2.40	3.84	4.67	23.82
2369	Pamlico Chemical Co., Washington, N. C.	Pamlico Tip Top Potato Guano.	Camden.	7.94	2.94	1.06	4.00	4.86	24.74
2628	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's 8-5 Ammoniated Phosphate.	Elizabeth City.	8.41	2.72	1.22	3.94	4.79	24.96
Brand claiming									
2164	Upton, L. J., & Co., Norfolk, Va.	Upton's Truck Guano.	Camden.	8.00			5.76	7.00	32.19
Brands claiming									
2279	Aene Mfg. Co., Wilmington, N. C.	Aene 9-3-0 Special Fertilizer.	Hope Mills.	9.00	1.04	1.36	2.40	4.13	19.08
2434	do.	do.	Elise.	8.22	1.66	1.26	2.92	3.55	20.48
2435	do.	do.	Lena.	9.18	1.04	1.46	2.50	3.04	19.68
2454	do.	do.	do.	8.99	1.08	1.46	2.54	3.09	19.66
2539	do.	do.	Lumberton.	9.39	.86	1.64	2.50	3.04	19.89
2644	do.	do.	Wakulla.	9.17	1.00	1.24	2.24	2.72	18.58
2469	American Fertilizer Co., Norfolk, Va.	American 9-3 Ammonia Compound.	Fayetteville.	9.19	1.54	.48	2.02	2.46	17.67
2487	Arps, George L., Co., Norfolk, Va.	Arps' Acid Phosphate Ammonia Mixture.	Rich Square.	9.10	1.70	.84	2.54	3.09	19.77
2273	Atlantic Chemical Co., Norfolk, Va.	Atlantic Orlando.	Ahoskie.	8.41	1.66	.74	2.40	2.92	18.49
2733	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co.'s 9-3-0 Fertilizer.	Sims.	9.02	1.62	.78	2.40	2.92	19.10
2127	Coweta Fertilizer Co., Newnan, Ga.	Coweta 9 and 3 Ammonia Compound.	Dunn.	8.46	1.66	.84	2.50	3.04	19.96
2615	Grandy, N. G., & Co., Elizabeth City, N. C.	Grandy's 9-0 Fertilizer.	Elizabeth City.	9.60	1.98	.88	2.86	3.48	21.61
2374	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Gold Leaf Tobacco.	New Bern.	8.79	1.70	1.32	3.02	3.67	21.47
2507	do.	do.	Cove City.	8.61	1.02	1.10	2.12	2.58	17.51
2521	do.	do.	do.	8.89	1.04	1.42	2.46	2.99	19.22
2459	McNair Phosphate Co., Laurinburg, N. C.	9-3 Ammoniated Guano.	Fayetteville.	9.07	1.50	.62	2.12	2.58	17.97
2985	Navassa Guano Co., Wilmington, N. C.	Navassa Standard Ammoniated Superphosphate.	Roseboro.	9.49	1.72	.68	2.40	2.92	19.57
2342	Norfolk Fertilizing Co., Norfolk, Va.	Oriana 3-9-0 Fertilizer.	Fayetteville.	8.80	1.72	.96	2.68	3.26	20.06
2267	Old Buck Guano Co., Richmond, Va.	Old Buck Nine-Three.	Ahoskie.	8.69	1.74	.78	2.52	3.06	19.27
2387	Patapasco Guano Co., Baltimore, Md.	Patapasco Fish Mixture, 9-3-0.	Elm City.	9.62	1.82	.74	2.56	3.11	20.37

Brands claiming		10.00	1.65	2.00	16.93
2442	Bryant Fertilizer Co., Alexandria, Va.	10.61	.46	1.50	16.91
2311	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	11.93	1.06	1.46	18.06
2439	Constee Chemical Co., Wilmington, N. C.	8.80	.54	2.40	18.88
2172	Farmers Guano Co., Raleigh, N. C.	9.86	1.24	2.24	17.59
2309	Georgia Chemical Works, Augusta, Ga.	9.72	.46	1.94	17.87
2179	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	9.96	.18	1.86	17.77
2590	Old Buck Guano Co., Richmond, Va.	10.59	.64	1.54	17.06
2586	Va.-Car. Chemical Co., Richmond, Va.	10.32	.32	1.56	16.87
Brands claiming		10.00		2.47	20.37
2175	Baugh & Sons Co., Philadelphia, Pa.	9.86	1.62	2.44	20.11
2392	Va.-Car. Chemical Co., Richmond, Va.	10.00	1.26	1.32	20.83
Brands claiming		10.00		3.29	23.82
2373	Carolina Union Fertilizer Co., Norfolk, Va.	10.17	1.84	1.42	23.86
2611	Columbia Guano Co., Norfolk, Va.	11.07	2.04	.98	23.75
2223	Patapsee Guano Co., Baltimore, Md.	8.38	2.08	1.08	21.65
2899	Southern Cotton Oil Co., Shelby, N. C.	10.04	2.32	.80	23.14
2627	Upshur, R. L., Guano Co., Norfolk, Va.	10.20	2.20	.96	23.47
Brand claiming		11.00		2.47	21.37
2362	Tuscarora Fertilizer Co., Greensboro, N. C.	10.69	1.32	1.10	20.85
Brands claiming		12.00		1.65	18.93
2242	Baugh & Sons Co., Philadelphia, Pa.	11.80	1.20	.64	19.53
2331	Royster, F. S., Guano Co., Norfolk, Va.	11.35	1.06	.66	18.57
Brand claiming				14.81	59.24
2688	Armour Fertilizer Works, Wilmington, N. C.			14.88	59.52
Brand claiming				14.92	59.68
2622	Meadows, E. H. & J. A., Co., New Bern, N. C.			15.00	60.00
Brands claiming				15.00	60.00
2741	Grace, W. R., & Co., New York, N. Y.			14.80	59.20
2398	Nitrate Agencies Co., Norfolk, Va.			14.92	59.68
2391	Winborne Guano Co., Norfolk, Va.			15.16	60.64

ANALYSES OF COMMERCIAL FERTILIZERS—MAY 1, 1917, TO JULY 1, 1917.

RAW OR UNMIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Phosphash	
Brands claiming										
2658	Aeme Mfg. Co., Wilmington, N. C.	Aeme 16 Per Cent Acid Phosphate	Fayetteville	16.00						14.40
2466	American Agricultural Chemical Co., New York, N. Y.	16 Per Cent Superphosphate	St. Paul	17.44						15.70
				16.34						14.71
2262	American Fertilizer Co., Norfolk, Va.	American High Grade Acid Phosphate	Smithfield	16.15						14.53
2497	Armour Fertilizer Works, Greensboro, N. C.	Armour's 16 Per Cent Acid Phosphate	Shelby	16.50						14.85
2488	Arps, George L., & Co., Norfolk, Va.	Arps' High Grade 16 Per Cent Acid Phosphate.	Rich Square	15.86						14.27
		Atlantic High Grade 16 Per Cent Acid Phosphate.								
2272	Atlantic Chemical Corporation, Norfolk, Va.	Atlantic High Grade 16 Per Cent Acid Phosphate.	Ahoskie	16.00						14.40
2465	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 16 Per Cent Acid Phosphate	Fayetteville	16.97						15.27
2696	Conestee Chemical Co., Wilmington, N. C.	16 Per Cent Acid Phosphate	Tar Heel	16.97						15.27
2655	do	do	Vander	17.23						15.51
2629	Contentnea Guano Co., Wilson, N. C.	High Grade 16 Per Cent Acid Phosphate	Scotland Neck	16.64						14.98
2390	do	do	Spring Hope	16.14						14.53
2630	do	do	Tillery	16.42						14.78
2424	Cooperative Warehouse Co., Salisbury, N. C.	Farmers' Union 16 Per Cent Acid Phosphate.	Wake Forest	17.01						15.31
		High Grade Acid Phosphate								
2310	Georgia Chemical Works, Augusta, Ga.	High Grade Acid Phosphate	Liberty	17.49						15.74
2270	Hampton Guano Co., Norfolk, Va.	Hampton Supreme Acid Phosphate, 16 Per Cent.	Ahoskie	16.38						14.74
2624	Meadows, E. H. & J. A. Co., New Bern, N. C.	Meadows' Diamond Acid Phosphate	Cove City	16.86						15.17
2621	do	do	do	16.14						14.53
2438	do	do	Bailey	17.41						15.67
2255	McNair Phosphate Co., Laurinburg, N. C.	Acid Phosphate	Hope Mills	15.89						14.30

2448	do.	do.	St. Paul	16.07	14.46
2559	do.	do.	Fayetteville	16.45	14.80
2554	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	16 Per Cent Acid Phosphate	Trenton	16.47	14.82
2430	Norfolk Fertilizing Co., Norfolk, Va.	Oriana 16 Per Cent Acid Phosphate	Fayetteville	17.50	15.75
2556	N. C. Farmers' Union, Statesville, N. C.	N. C. Farmers' Union 16 Per Cent Acid Phosphate	Trenton	17.23	15.51
2494	do.	do.	Lawndale	16.79	15.11
2691	do.	do.	White Oak	17.67	15.90
2242	Patapsco Guano Co., Baltimore, Md.	Florida Soluble Phosphate	Patterson Springs	17.30	15.57
2298	Richmond Guano Co., Richmond, Va.	Dissolved Bone	Spring Hope	17.26	15.53
2422	Rock-Ashcraft-Wilkinson Co., Charleston, S. C.	16 Per Cent Acid Phosphate	Marshville	16.58	14.92
2332	Royster, F. S., Guano Co., Norfolk, Va.	Royster's High Grade 16 Per Cent Acid Phosphate	Fayetteville	15.93	14.34
2335	do.	do.	do.	16.85	15.16
2460	do.	do.	do.	16.29	14.66
2593	Thomlinson Company, Wilson, N. C.	Magie Dissolved Bone	Wilson	16.64	14.98
2564	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid Phosphate	China Grove	16.74	15.07
2619	Scotland Neck Guano Co., Scotland Neck, N. C.	16 Per Cent Acid Phosphate	Cove City	16.98	15.28
2618	do.	do.	do.	16.46	14.81
2492	Southern Cotton Oil Co., Shelby, N. C.	S. C. O. Co.'s 16 Per Cent Acid Phosphate	Shelby	17.25	15.52
2423	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's 16 Per Cent Acid Phosphate	Elizabeth City	16.87	15.18
2507	Va.-Car. Chemical Co., Richmond, Va.	Comet 16 Per Cent Acid Phosphate	Mount Airy	16.19	14.57
2592	do.	S. W. Travers' Standard Acid Phosphate	Clyde	17.39	15.65
2361	do.	V.-C. 16 Per Cent Acid Phosphate	Pineville	17.00	15.30
2359	do.	do.	Fort Mills	16.69	15.02
2226	Winborne Guano Co., Norfolk, Va.	High Grade 16 Per Cent Acid Phosphate	Edenton	15.90	14.31

Additional fertilizer analyses to July 1st, 1917.

B. W. KILGORE,

State Chemist.

THE BULLETIN
OF THE
NORTH CAROLINA
DEPARTMENT OF AGRICULTURE
RALEIGH

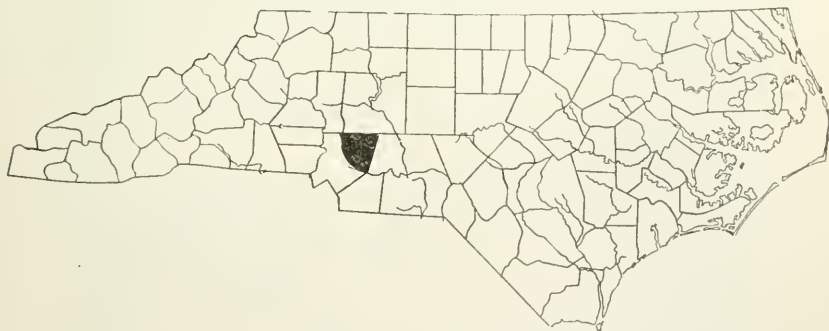
Vol. 38, No. 8

AUGUST, 1917

Whole No. 235

COUNTY SOIL REPORT, No. 4

REPORT ON
CABARRUS COUNTY SOILS AND AGRICULTURE



MAP SHOWING SOIL SURVEY AREA OF CABARRUS COUNTY

This work was done by the Division of Agronomy of the State Department of Agriculture in coöperation with the Bureau of Soils of the Federal Department of Agriculture.

PUBLISHED MONTHLY AND SENT FREE TO CITIZENS ON APPLICATION.

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*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

LETTER OF TRANSMITTAL

July 20, 1917

SIR: Herewith I transmit a *Report on the Soils and Agriculture of Cabarrus County*. The data on the soils included in the report were gathered in a systematic soil survey of the county made in 1910 in co-operation with the Bureau of Soils of the United States Department of Agriculture.

In the recommendations with reference to the soils and their plant-food requirements, we have been largely guided by the results secured in carefully conducted soil-type field experiments in Cabarrus and adjoining counties.

I would recommend that this report be issued as County Report No. 4.

Respectfully submitted,

C. B. WILLIAMS,

Chief, Division of Agronomy.

Approved:

W. A. GRAHAM,

Commissioner of Agriculture.

REPORT ON CABARRUS COUNTY SOILS AND AGRICULTURE

BY C. B. WILLIAMS, W. E. HEARN, J. K. PLUMMER AND W. F. PATE.

Cabarrus County lies in the west-central part of North Carolina. It is bounded on the north by Rowan and Iredell counties, on the east by Stanly County, on the south by Union and Mecklenburg counties, and on the west by Mecklenburg County. It contains 368 squares miles or 235,520 acres.

SURFACE FEATURES

The general surface features or topography of Cabarrus County consist of a series of gently rolling to almost level interstream areas, which



FIG. 1.—Typical landscape, showing gently rolling nature of the farm lands of the county

become more rolling, hilly, and broken as the streams are approached. A strip extending inward from 4 to 5 miles across the county along the Stanly County line has gently rolling surface features. In the vicinity of Harrisburg and to the north and also to the south of Pioneer Mills the surface is prevailingly flat to undulating, being the smoothest part of the county. The remainder and by far the greater portion of the

county is marked by gently rolling to rolling and broken surface features. Along the streams are narrow strips of flat bottom-land, and flanking these areas are the roughest parts of the uplands, being eroded and broken in many places. In general, the greater part of the county lies admirably for farming purposes.

ELEVATION

The elevation above sea level varies considerably in different parts of the county. The highest elevations are in the northern part. The elevation at Concord is 704 feet, farther west near Rocky River 716 feet, at Flows Store 678 feet, and Rocky River near Harrisburg 568 feet.

DRAINAGE

The general slope and drainage of the county is to the southeast except along the northeastern border, and here it is to the south, as revealed by the drainage system. The county is traversed by Rocky River and Coddle, Little Buffalo, Cold Water, Dutch Buffalo and Reedy creeks. These streams with their numerous branches and wet weather tributaries ramify all parts of the upland and furnish adequate drainage or outlets for every farm. The streams have cut their channels from a few feet to 60 feet or more below the general level of the county. They are fairly swift flowing, and along some of the larger creeks and Rocky River water power is developed and used for grinding corn, wheat, ginning cotton and as auxiliary power to operate small cotton mills.

SETTLEMENT

Cabarrus County was originally a part of Mecklenburg County, but was given separate organization by the State Legislature in 1793. Settlement began between the years 1730 and 1740 by a colony from Switzerland. Shortly after the Revolutionary War, the Dutch and Germans came in large numbers from Pennsylvania and settled in the eastern part, while the Scotch-Irish took up lands along the western border of the county. Settlement advanced slowly until the close of the Civil War, when a great impetus was given by the high prices of cotton, corn, and wheat. The population at present consists principally of the descendants of the original settlers and those who have moved into the county from various parts of North Carolina.

RAILROAD TRANSPORTATION AND ROADS

The main line of the Southern Railway crosses the county, passing through Concord. This affords good rail transportation to the central part. A branch line of this road touches the extreme northeastern corner but furnishes transportation facilities to only a small number of farmers in that region. The southeastern end is traversed by the Norfolk Southern Railroad which has been constructed since the soil survey of Cabarrus County was published. There is a large mileage of graded and macadam roads in the county, in addition to the well kept dirt roads in many sections.

TOWNS, MARKETS, AND INDUSTRIES

Concord, the county seat, is the principal town, having a population upwards of 10,000. Kannapolis, Glass and Harrisburg are other towns on the Southern Railway, while Mount Pleasant is a fair sized town, located about 9 miles east of Concord. There are several new towns along the Norfolk Southern Railroad.

These towns furnish excellent markets for the products of the farms, particularly for cotton, truck, and fruits, as there is a large cotton mill population to be fed. There is imported into the county perhaps more than 100,000 bales of cotton and used in addition to the cotton produced within its limits. Hay, corn, flour, meat, and dairy products, also are imported — a condition which should be reversed.

Concord is principally a cotton mill town, and so is Mount Pleasant and Kannapolis. Other manufacturing industries are operated in the county. This region is supplied with electricity generated on the Catawba River and many factories are thus supplied. The county offers inducements for manufactories of various kinds.

CLIMATE

The climate of Cabarrus County is well suited in general to the successful production of the crops now grown in the county. The average date of the last killing frost in spring is April 1 and of the first in fall November 4, giving a growing season of 218 days. The mean temperature for this period is 69° F.

There being no Weather Bureau station located in the county, it is necessary to refer to the records of the nearest outside station, which is at Charlotte, 10 miles west. The following table, compiled from records of this station, doubtless represents very closely the weather conditions of Cabarrus County:

NORMAL MONTHLY, SEASONAL, AND ANNUAL TEMPERATURE AND PRECIPITATION AT CHARLOTTE, N. C.

Month	Temperature			Precipitation			
	Mean	Absolute Maximum	Absolute Minimum	Mean	Total Amount for the Dryest Year	Total Amount for the Wettest Year	Snow, Average Depth
	<i>°F.</i>	<i>°F.</i>	<i>°F.</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
December.....	43	76	—5	3.8	1.9	5.7	2.2
January.....	41	77	—1	4.3	2.3	7.6	1.9
February.....	44	79	—5	4.6	5.4	6.4	2.9
Winter.....	43			12.7	9.6	19.7	7.0
March.....	51	85	14	4.8	1.6	9.2	0.6
April.....	59	94	26	3.4	1.9	5.4	0.1
May.....	69	97	38	3.9	1.7	4.8	0.0
Spring.....	60			12.1	5.2	19.4	0.7
June.....	76	102	45	4.6	3.4	9.5	0.0
July.....	79	102	55	5.3	6.4	7.9	0.0
August.....	77	100	53	5.2	1.0	2.1	0.0
Summer.....	77	101	51	15.1	10.8	19.5	0.0
September.....	72	99	38	3.3	4.7	3.6	0.0
October.....	61	92	30	3.4	1.0	1.5	T.
November.....	51	80	18	3.0	3.7	4.7	T.
Fall.....	61			9.7	9.4	9.8	T.
Year.....	60	102	—5	49.6	35.0	68.4	7.7

From this table it is seen that the hot summer months are also the months of the greatest precipitation. The annual rainfall varies from 35 to 68.4 inches and is well distributed. Droughty conditions seldom occur, and damage to crops is rarely suffered, except in the porous soils of the slate belt. In this section also farmers claim that killing frosts occur from ten days to two weeks earlier in the fall and later in the spring than in any other section of the county, lessening the length of the growing season as stated for Charlotte by twenty to thirty days.

The average temperature and precipitation for the months in which cotton and corn, the two principal crops, are grown indicate excellent growing weather. As a rule, the climate may be said to be very healthful.

AGRICULTURE

In the early days of settlement the main crops were wheat, corn, oats, and some flax. A few cattle and later many sheep and hogs were raised. The wool was manufactured into cloth and the corn in excess of that necessary for home consumption was manufactured into whiskey.

Later, with an influx of settlers, the agriculture was broadened. The individual plantation of the western settlers of the county comprised a larger acreage than those of the eastern settlers, thereby giving those settlers a better opportunity to diversify their crops. The large open "prairies" or glades in the western part of the county were covered with a luxuriant growth of grasses which afforded excellent and extensive pastures for cattle and sheep. These were driven in large droves to Columbia and Fayetteville and sold.

Until a few years before the Civil War the growing of corn, small grains, and various home supplies continued to increase with the influx of new settlers. Practically no cotton was produced in the eastern half of the county prior to the war, but a considerable acreage was devoted to that crop throughout the western part of the county. The growing of cotton, however, lessened the surplus product of the corn and grains, and in some instances it was necessary to import some of these articles into the cotton belt. The live-stock interests declined as cotton assumed more importance.

According to the census for 1860 Cabarrus County produced about 124,000 bushels of wheat, 368,000 bushels of corn, 33,000 bushels of oats, about 5,000 bales of cotton, about 5,000 tons of hay, and 6,000 bushels of peas, together with a large quantity of sweet and Irish potatoes, some rye, and a large number of live stock. Until 1880 there was practically no change in the production of corn, while the quantity of oats grown was almost double that of 1860, and the amount of cotton had increased to 7,500 bales. The quantity of wheat produced decreased considerably, as only 84,000 bushels were reported in 1880. Following the war many of the large plantations were divided or small tracts sold off and consequently the size of individual holdings of land had greatly diminished. This tendency continued until 1900, when the average size farm in Cabarrus County was about 102 acres. By 1900 the amount of cotton produced in the county had increased to 8,000 bales and wheat to 127,000 bushels, but the production of corn had diminished to 284,000 bushels. The quantity of oats produced remained practically the same as in 1880. During the period from 1890 to 1900 agriculture was being carried on upon a more scientific basis and a much greater variety of products were grown. A small acreage was devoted to the production of clover, millet, tame grasses, and forage crops, while the value of vegetable and orchard products greatly increased.

At the present time cotton is the important money crop. Too much attention is being paid to its production in proportion to the other crops grown. While it is well to grow this money crop, the present production could well be secured from a smaller acreage, thereby giving a larger acreage to other crops, providing an opportunity for greater diversification and promoting more scientific methods of soil management.

Corn ranks next in importance to cotton and is grown in all parts of the county on practically every soil type. More wheat is produced now than formerly and its production is on the increase. Oats and rye are grown to much smaller extent than wheat. Until recently cowpeas were grown only to a limited extent, but now quite a large acreage is devoted to this crop. A small acreage of soy beans and crimson clover were reported. Sorghum cane is grown in small patches on nearly every farm, to be used in the manufacture of sirup for home use. Tobacco is also grown in small patches on a number of the farms to supply home demands. Irish potatoes, sweet potatoes, and cabbage, together with a large variety of other garden vegetables, are grown in all parts of the county. A considerable number of goats, sheep, hogs, and some cattle are raised. Of the fruits apples are grown to the largest extent, while peaches, pears, cherries, damsons, figs, and a few grapes are also produced for home use and the local markets.

By far the greater number of farmers in the county do not pay sufficient attention to the adaptation of the various soil types to certain crops. It has been generally recognized that the bottom soils are best suited to the production of corn and grasses and that the sandy loams and lighter areas of clay loams, particularly of the Cecil series, give the more profitable yields of cotton.

The "red lands" (Mecklenburg and heavy types of Cecil), "blackjack lands" (Iredell), and certain areas of the "slate lands" (Alamance and Georgeville), are admirably adapted to the production of wheat, corn, and oats, as well as clover, cowpeas, and soy beans. The lighter areas of the sandy loams and the slate soils give the best returns from apples, peaches, pears, damsons, grapes, and other fruits grown in the county.

In general practically no regular crop rotation is practiced. A few farmers follow definitely planned cropping systems which could be profitably applied to most of the soils throughout the county where general farming is the rule. A good rotation in present use is: First year, cotton; second year, corn, sowing cowpeas at last plowing; and third year, wheat, oats, or other small grain, sowing cowpeas on the grain stubble. By this method cotton, a clean-cultivated crop, follows a nitrogen-gathering crop. The soil should show improvement from year to year with such treatment. In those sections where cotton is not grown to any extent it would be well to rotate corn with small grains and grasses and not to plant the same land to any one crop for more than one or two years at a time. Of course, an exception to this method would be the bottom-land soils, which are naturally productive and upon which corn and grasses can be produced for a long time without causing much soil deterioration, as compared with the lighter up-land soils.

There has been no marked change in the methods of preparing the land or in cultivating the crops from those of earlier years. The one-horse plow, hand hoes, and ordinary spike-tooth harrows are the ordinary implements used. Nevertheless a gradual change is taking place, and more modern methods are gaining ground with the better class of farmers. In many instances disk plows, two-horse turn plows, and sulky plows are supplanting the less efficient type, and large drag harrows, wheat drills, sulky cultivators, binders, mowing machines, and hay tedders are being used more and more. This modern machinery enables the farmers to plow deeper, to prepare the soil more thoroughly, and to cultivate the growing crops more easily and cheaply. Its use also results in much larger yields.

Practically all crops are fertilized to a greater or less extent. The consumption of commercial fertilizers is gradually increasing. A majority of the farmers buy the "complete" mixtures, chiefly brands of 8-2-2 or 8-3-3 formulas. Fertilizers are applied to crops regardless of kind and type of soil upon which they are to be produced. Some of the farmers buy cottonseed meal, acid phosphate, and kainit and mix them at home. It is a well established fact that the more humus the soil contains the larger the quantity of fertilizer that can be profitably used. Applications of lime unquestionably would benefit the clayey and silty soils, especially where these tend to assume a compact structure. An acreage application of something like 1 to 2 tons of lime following the turning under of a green or partially matured crop, as cowpeas or rye, would certainly benefit the heavy upland soils.

As a general rule there is a comparatively small amount of labor employed upon the farms in Cabarrus County. More labor is used in the western half of the county on the larger plantations than elsewhere. Farm labor consists largely of negroes, who receive, when hired by the month, about \$15 with board. Day laborers are paid from 75 cents to \$1.25 a day, the higher wage ruling during the busy seasons, and on farms near the larger towns.

Throughout the eastern half of the county, particularly in the slate belt and also in many parts of the western half of the county, the farms are operated directly by the owners, while many of the larger farms are looked after by managers. Some farms are leased for cash rent or a definite quantity of cotton, or it may be on a share basis. On a share basis the landlord furnishes the land, stock, feed for stock, implements, and one-half the fertilizer and receives one-half the crops. Where the tenant furnishes stock and fertilizers the landowner receives only one-third the products.

The farms vary in size for different parts of the county, the largest ones being confined principally to the western part. Some of the larger estates contain from 300 to 900 acres and a few contain even greater acreages, the largest about 1,800 acres. The greater number of farms, however, range in size from 20 to 100 acres, the average being about 100 acres.



FIG. 2.—Showing the character of the forest growth on Alamance silt loam

The land values of the county vary with nearness of railway facilities and local markets. The best farming lands within a radius of 5 miles of Concord and near Harrisburg and Kannapolis are valued at about \$60 an acre, while the same lands at greater distances from the markets, particularly in the northwest and southwest parts of the county, sell for \$20 to \$50 an acre. The lands throughout the slate belt in the eastern half of the county range in value from \$8 to \$15 an acre, the greater proportion being nearer the higher price.

In handling the soil problems of Cabarrus County one of the essential needs is the draining and reclaiming of the large areas of bottom land lying along the river and larger creeks. Although these areas in their present condition are practically worthless, except for pasture and some hay, they could be made productive through drainage, which could be accomplished by dredging and straightening the stream courses and cutting lateral ditches leading into these natural drainage ways. The soils of the stream bottoms if reclaimed would produce large yields of corn, oats, and sorghum.

In many sections of the county the slopes and hillsides have become guillied and eroded, but with the exception of a few of the steeper and more severely eroded hillsides, practically all of Cabarrus County could be farmed, and even these now abandoned rough spots could either be reforested or shaped up and used for pasture lands. Some terracing of the hillsides is now practiced to prevent washing. This may be necessary on the steeper slopes, but existing terraces could often be eliminated by deeper plowing and by seeding the land to winter cover crops, such as crimson clover, vetch, or even rye, thus returning to profitable cultivation areas now lying idle.

There is nothing that will give the farmers larger returns for the labor expended than would deeper plowing and a more thorough preparation of the seed bed on the heavy types of soil. Deep plowing in the fall will aid the proper tillage of these soils, the desirable tilth being more easily secured after the frosts have acted upon the rough furrow slices. Fall plowing, however, leaving the soil unoccupied, can only be recommended upon lands that are not subject to erosion. These stiff, intractable soils need to be loosened up and aerated in order to give the plant roots a larger feeding zone. Such manipulation allows more of the rainfall to be absorbed, thus insuring a better supply of moisture during dry seasons and giving better drainage in wet seasons.

Throughout Cabarrus County there are large areas of soil, particularly the light sandy loams and silt loams, which are decidedly deficient in humus. This important element may be supplied by the growing of cowpeas, crimson clover, and vetch, or by applying barnyard manure. The addition of these organic materials tends to make the light soil more loamy in character and greatly increases their power to retain water, while it loosens up the compact, heavy, clayey and silty soils, permitting more complete aeration and easier tillage.

More systematic rotation, growing a greater diversity of crops, should be practiced by a majority of the farmers, especially those who now depend mainly on cotton. While all of the necessary products are grown to some extent for home use, considerable quantities of corn, hay, flour, and meat are shipped into the county. All of these products could be produced on the farms, and Cabarrus County could easily be made an exporting rather than an importing county.

Another important means toward obtaining large yields is the securing of good stands of plants. In order to accomplish this, much attention is necessary to the selection of seed. It is a waste of time and money to cultivate a field with only a partial stand. On some of the soils, particularly the heavy clays and in the slate belt, cotton sometimes fails to mature before the early frosts. It should be the endeavor of every farmer in selecting his seed to secure for such soils an early maturing variety. Varieties suited to the clay soils will not give the best yields on the lighter sandy soils, and vice versa.

The North Carolina Department of Agriculture at Raleigh is now working out varieties of seed adapted to the various soil types and also the fertilizer requirements for these different soils. Anyone can secure valuable information along this line upon application to that department.

SOILS AND THEIR ORIGIN

Carbarrus County lies wholly within the Piedmont Plateau province, and all of its soils with the exception of small strips of bottom-land, have been formed through the processes of weathering from the underlying rocks, which may be seen at varying depths from the surface. The important rock formations in the county are granite, gneisses, diorites, gabbros, and slates. These rocks differ widely in their physical and chemical composition, and the decay of these give soils of different color, structure, texture, and varying greatly in the elements of plant food.

The slate rocks, known as the "Carolina Slates," occur in a belt varying from 4 to 5 miles in width across the eastern boundary of the county along the Stanly County line. These slates are fine-grained and bluish to gray in color, but upon weathering and oxidizing, the colors become brilliant, and shades of purple, blue, red, yellow, and gray are common. They have not weathered to as great depths as the granites, and frequently the broken slate is reached within 3 feet of the surface, and even outcrops are seen in short distances. The weathering of these give rise to soils having a floury-smooth feel and silty texture and commonly called "lean" or poor soils. The light gray to whitish soils with yellow friable subsoils belong to the Alamance series. This group contains the silt loam, silt loam (shallow phase), and the slate loam. The gray to red surface soils, with red silty clay subsoils, are classed as the Georgeville. Only one type, the silt loam, was mapped. The red color of the Georgeville soils is due to a larger amount of iron in the slate rock or to a further stage of oxidation of iron than has taken place in the Alamance.

In the southwestern part of the county around Harrisburg and to the north thereof, for several miles, occurs an area of diorite, diabase, or gabbro rocks. These are dark colored, hard rocks, sometimes called "nigger head rocks," which have decayed into brown to reddish brown soils and have yellowish brown or ochreous-colored heavy plastic impervious clay subsoils. Here the rotten rock is usually reached at from 2 to 3 feet. The soils have been classed into the Mecklenburg series, and two types occur, the sandy loam and the clay loam.

The remaining, or greater part of the county, is underlain by granites, gneisses, and diorites, the latter occurring in small bodies throughout the granite and gneisses. The granites and gneisses are composed of quartz, feldspar, and mica. In their decay into soil the quartz is left as sand,

gravel, or quartz rock; the feldspar gives the clay, and the mica is seen as flakes. These rocks give the Cecil and Durham soils. The Cecil soils are gray to red in the surface portion and have bright red, hard, brittle clay subsoils. The Cecil coarse sandy loam, sandy loam, fine sandy loam, loam, clay loam, and clay are formed. The Durham soils



FIG. 3.—A typical farm home

are light gray and have yellow friable clay subsoils. Two types, the coarse sandy loam and sandy loam, occur. From the red color of the Cecil soils it would seem that the rocks from which they are derived contain a higher percentage of the iron-bearing minerals than those giving the Durham, and the oxidation of this iron gives it the intense red color.

The diorites are dark green heavy rocks, locally called "nigger head" rocks, and occur throughout the granite and gneiss formations. The Iredell soils have been derived from the weathering of this diorite. They consist of gray to brown soils and have yellowish or brownish-yellow, waxy, putty-like, clay subsoils. Like the Mecklenburg soils, the yellowish-green, soft diorite rock is generally found at 18 to 36 inches below the surface.

Along most of the streams throughout the county are developed narrow strips of bottom-land or alluvial soils. These soils represent materials washed from the uplands—that is, the cream of the uplands—and deposited by overflow water upon the flood plains. The heavy material is a brown to reddish-brown color, and where having a uniform texture has been classed as Congaree silty clay loam. The material in the bottom-lands is mixed up in texture and the soils have a lower agricultural value due to lack of drainage. They are termed Meadow.

The following classification shows the soils of the county grouped according to origin and important physical differences:

Soils derived in place from weathered products of underlying rocks.	Mainly from fine to coarse grained granite and gneiss. Gray to red soils, red clay subsoils.	Cecil coarse sandy loam. Cecil sandy loam. Cecil fine sandy loam. Cecil loam. Cecil clay loam. Cecil clay
	Mainly from light-colored highly siliceous granite. Gray soils, yellow sandy clay subsoils.	Durham coarse sandy loam. Durham sandy loam.
	Mainly from intrusive rocks, as diorite. Reddish soils, yellowish plastic clay subsoils.	Mecklenburg sandy loam. Mecklenburg clay loam.
	Mainly from intrusive rocks, as diorite. Dark-brown soils, yellowish waxy clay subsoils.	Iredell fine sandy loam. Iredell loam.
	Mainly from fine ground bluish slate.	Alamance silt loam. Alamance silt loam (shallow phase.) Alamance slate loam.
	Gray soils, yellow silty clay subsoils.	Georgeville silt loam.
Soil washed from uplands and deposited in stream bottoms. Alluvial material subject to overflow.		Congaree silty clay loam.
Soil washed from uplands and deposited in stream bottoms. Varied textural material undifferentiated. Subject to overflow.		Meadow.

The following table gives the actual and relative extent of the several soils. Their distribution is shown by means of colors on the accompanying map:

AREAS OF DIFFERENT SOILS.

Soil	Acres	Per Cent	Soil	Acres	Per Cent
Cecil clay loam.....	53,632	22.8	Congaree silty clay loam.....	7,360	3.1
Alamance silt loam.....	21,218	13.6	Cecil fine sandy loam.....	7,010	3.0
Shallow phase.....	10, 52		Mecklenburg sandy loam.....	6,461	2.7
Cecil sandy loam.....	23,168	9.8	Alamance slate loam.....	5,824	2.5
Iredell loam.....	22,528	9.6	Durham sandy loam.....	5,760	2.4
Georgeville silt loam.....	15,296	6.5	Meadow.....	4,736	2.0
Iredell fine sandy loam.....	13,312	5.7	Durham coarse sandy loam.....	3,200	1.4
Cecil clay.....	13,056	5.5	Cecil loam.....	960	.4
Mecklenburg clay loam.....	10,944	4.7			
Cecil coarse sandy loam.....	10,240	4.3	Total.....	235,520	-----

CECIL CLAY LOAM

The Cecil clay loam, locally called "red land," is the largest and most important soil for general farming purposes in the county. It covers 53,632 acres or nearly one-fourth of the total land area in Cabarrus County. Large areas of this soil are scattered over all parts of the county, excepting the slate belt, being well developed around Bost's Mill, Pioneer Mills, Rimer, to the east and southwest of Concord, and also in the northwestern corner of the county.

This soil consists of a brown to red heavy loam to clay loam ranging in depth from 6 to 10 inches. The subsoil to a depth of 3 feet or more is a bright red stiff clay, plastic when wet and hard and crumbly when dry. To the west of Concord the subsoil contains a noticeable amount of small scales of mica. In the northwestern part of the county the surface soil for the first 2 or 4 inches may be a heavy sandy loam. In other localities the surface soil is a dark brown to reddish brown clay called "push land" or "dead land," because it does not turn easily from the moldboard. On eroded knolls and slopes spots of clay are of frequent occurrence.

The Cecil clay loam surface varies from nearly level or undulating to rolling and broken, the more level areas occurring in the vicinity of Rimer, Five Pines, and Barrier School. The more rolling and broken areas are found usually along Cold Water, Dutch Buffalo, and Irish Buffalo creeks and Rocky River. In places the smaller streams have cut deep gullies in the hillsides and given a rough and broken surface. Much of this soil, however, lies beautifully for farming purposes, particularly the broad interstream areas. All of the type possesses good natural drainage, the run-off being excessive on the steeper slopes.

This soil is best suited for the growing of wheat, corn, oats, cowpeas, clover, and grasses, although cotton and all crops common to the county are successfully produced. The best yield of cotton, potatoes, sorghum, and garden vegetables are obtained from the lighter areas or those having considerable sand in the surface soil. Cotton yields from $\frac{1}{4}$ to 1 bale per acre; corn from 15 to 50 bushels; wheat from 15 to 25 bushels; and oats from 20 to 60 bushels per acre.

The amount of sand usually present in the surface soil of the clay loam renders it more friable and easier to till than the heavy red clay. To improve this land and to increase the yields, deeper plowing, more thorough pulverization of the soil, together with the addition of manure or other vegetable matter, are recommended. When green manuring crops are turned under a liberal application of lime gives beneficial results.

The following table gives the average results of analyses of soil and subsoil of Cecil clay loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.078	.078	1.442	.119	1493	1514	27826	8739
Subsoil }	.023	.062	.974	.311	1861	4913	77092	24806

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil-----	1.7	5.2	6.0	16.1	21.3	27.0	22.7
Subsoil-----	.9	2.1	2.3	5.3	8.5	32.2	49.0

CECIL CLAY

The Cecil clay, locally known as "heavy red clay land," comprising 13,056 acres, consists of a reddish-brown to deep red clay loam or clay, with a depth of 5 or 6 inches. It is underlain by a red stiff heavy clay, being brittle when dry and sticky and plastic when wet. It is distributed in small areas over the greater part of the county, the larger areas being situated between Concord and Poplar Tent Church to the north of Mount Pleasant and in the southern part of the county. The surface is rolling to hilly, and even broken, and the natural drainage is good.

A considerable part of this soil is forested in white, red, and post oak, some hickory, sweet-gum, dogwood, poplar, and pine. The Cecil clay is recognized as one of the strongest soils in the county for the production of wheat, oats, corn, clover, and grasses, and is susceptible to high agricultural improvement. Some areas of this soil, especially those associated with Mecklenburg clay loam, are well suited to the growing of alfalfa. Heavy applications of lime and manure and thorough preparation of the soil and inoculation of it are essential in securing a good stand. Large yields of wheat, oats, corn, and clover are obtained, while cotton does fairly well. The turning under of clover, cowpeas, or manure add humus and improve the structure of the soil, together with deeper plowing, and better preparation of the seed-bed and the addition of lime are suggested for increasing the yields upon the Cecil clay. This land requires strong teams and heavy equipment for the highest efficiency of crop production.

The following table gives the average results of analyses of soil and subsoil of Cecil clay.

CHEMICAL ANALYSIS.

		Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,600,000 Lbs.			
		Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ P)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface	} 2 mm. {	.087	.072	.147	.32	1607	1428	2916	6348
Subsoil		.031	.245	.35	.17	2480	19600	28000	13600

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	0.5	2.8	6.4	16.5	13.3	26.0	33.8
Subsoil.....	0.2	1.0	1.9	4.2	5.1	36.8	50.8

CECIL SANDY LOAM

The Cecil sandy loam is one of the large and important types, covering as it does 23,168 acres or about 10 per cent of Cabarrus County. It is widely distributed over all parts with the exception of the slate belt on the eastern side. Large areas lie to the east, north, and west of Concord and south of Rocky River.

The surface soil is a gray to light brown medium sandy loam, 5 to 10 inches deep. The subsoil to a depth of 3 feet or more is a stiff bright red clay, hard and crumbly when dry and sticky while wet. Occasionally the subsoil is mottled with yellow, this being noticeable especially to the east of Concord. In places the surface soil may be a coarse sandy loam, and again a reddish-brown clay loam is seen where the surface soil has been washed off.

It occupies the smooth broad ridges, which becomes rolling and broken as the streams are approached. The natural surface drainage is good, and no ditching is necessary; but terracing of the hillsides is essential in places to prevent erosion.

The soil is loose in structure, is easily tilled with improved machinery, and warms up early in the spring. These favorable features render the soil capable of producing a wide range of crops, and it is considered one of the best soils in the county. The sandier areas are especially adapted to truck crops, sweet potatoes, watermelons, peanuts, and mahogany tobacco, while the heavier portion of the type is suited to cotton, small grains, corn, cowpeas, and soy beans.

Corn usually yields about 15 to 20 bushels per acre, and when matured and properly cultivated as much as 50 to 75 bushels per acre may be obtained; wheat from 8 to 20 bushels; and oats from 20 to 40 bushels per acre.



FIG. 4.—A modern type of sand-clay road that is being constructed in parts of the county

The Cecil sandy loam is capable of being built up to a higher state of productiveness by deeper plowing, increasing depth gradually, better cultivation, and by the incorporation of green manuring crops, such as clover, cowpeas, and soy beans. The clay subsoil enables the soil to hold the improvements, and beneficial effects of manures are quite lasting.

The following table gives the average results of analyses of soil and subsoil of Cecil sandy loam:

CHEMICAL ANALYSIS.

	Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.019	.019	1.78	.1962	622	278	41488	4902
Subsoil }	.020	.058	1.374	.51	1640	4640	109960	40800

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	7.0	20.1	16.9	22.3	7.4	21.5	5.4
Subsoil.....	2.6	9.9	7.1	9.7	4.7	38.8	32.1

CECIL COARSE SANDY LOAM

This is the gray to reddish-brown coarse sandy soil, having a red sandy clay or stiff clay subsoil. The soil carries a considerable quantity of fine gravel, and this, together with coarse sand, gives a loose, porous structure to the material in some places, while in others there is enough silt and clay to cause the soils to bake slightly.

There are 10,240 acres of this soil, and most of it lies in the northern end of the county around Kannapolis. Bodies of it also occur to the west of Gillwood Church and northeast of Bogens Chapel. It is developed on the broad ridges, having a gently rolling to rolling surface and possessing excellent natural drainage. It warms up comparatively early in the spring, and this fact renders it suitable for the growing of vegetables. Corn, cotton, wheat, oats, cowpeas, sorghum cane, sweet potatoes, and peanuts are successfully grown. In the deeper and more sandy areas bright tobacco can be produced profitably. This soil is fertilized and handled in the same way as the sandy loam, and the recommendations suggested for the improvement of that type will apply well to the coarse sandy loam.

The following table gives the average results of analyses of soil and subsoil of Cecil coarse sandy loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.036	.046	4.18	.27	594	759	68970	4455
Subsoil }	.017	.051	3.578	.48	1270	3111	267348	36866

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	15.9	23.2	11.0	18.4	4.0	21.9	5.6
Subsoil.....	3.8	9.6	6.0	8.4	2.4	25.0	44.8

CECIL FINE SANDY LOAM

This type is next to the smallest in size of Cecil soils in the county. It embraces only 7,040 acres. Most of it is confined to the northern part of the county between Heilman's Mill and Barrier School, with scattering bodies to the south of Harrisburg and Poplar Tent Church near Pioneer Mills.

The surface soil is gray to reddish-brown fine sandy loam to a depth of about 5 to 10 inches, being mellow and friable. It is underlain by red stiff clay which shows mottlings of yellow in places below 24 inches. Its surface varies from almost level to rolling and hilly, and the drainage is good for the greater part of it.

About one-half of the type is under cultivation and the remainder is forested principally to hardwoods. Corn and cotton are the main crops grown, and the yields are about the same as upon the Cecil sandy loam. Wheat and oats and also cowpeas do well on the heavier areas of this soil.

The following table gives the average results of analyses of soil and subsoil of Cecil fine sandy loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.044	.171	4.833	.572	873	3392	94919	11348
Subsoil }	.019	.112	2.730	.040	1520	8960	218400	3200

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.8	7.4	11.0	25.3	17.4	29.8	7.3
Subsoil.....	2.1	4.9	6.3	12.5	7.1	31.5	35.6

CECIL LOAM

The Cecil loam is the smallest type in the county, there being only 960 acres. This soil lies to the west and south of Concord, along what is known as "Rock Ridge." White Hall and Jackson Training School are also located upon it.

The soil is a brown to gray loam of a mellow structure, and the subsoil is a red stiff brittle clay, passing usually at from 18 to 24 inches into rotten rock. Large boulders and fragments of rock occur on the surface, and frequently the bedrock joins the surface soil. It occupies the high ridges, having almost level surface features, and is naturally well drained. The shallow soil areas underlain by rock are liable to suffer from drought.

Cotton, corn, and wheat are grown, and fair yields are obtained. Cotton, lima beans, Irish potatoes, cabbage, and vegetables give better returns than other crops.

The following table gives the results of mechanical analysis of samples of the soil and subsoil of the Cecil loam:

MECHANICAL ANALYSIS OF CECIL LOAM.

Number	Description	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
24362.....	Soil.....	3.5	5.7	5.8	15.5	17.3	37.6	14.4
24363.....	Subsoil.....	0.4	1.5	2.0	6.2	6.0	23.4	60.5

DURHAM SANDY LOAM

This soil and the Durham coarse sandy loam are the "whitish" or "light gray sandy lands" of this region. There are 5,760 acres of the Durham sandy loam in the county. Most of this soil occurs in rather large bodies to the southeast of Concord and southwest of Mount Pleasant, and also to the northeast of Macedonia.



FIG. 5.—This scraper is being used quite commonly to put the roads in better shape

The surface soil to a depth of about 8 to 15 inches is a light gray loamy sand containing a few quartz fragments. The subsoil is a yellow friable clay or sandy clay. It occupies level to gently rolling to hilly surface features, the rougher areas comprising the slopes near the streams. The best farming areas lie to the southwest of Mount Pleasant and on the ridges in the vicinity of Concord. It is well drained.

The Durham sandy loam gives fair yields of corn and cotton when fertilized or manured. It is best suited to the growing of sweet potatoes, peanuts, rye, sorghum cane, watermelons, and garden vegetables and fruits. It is admirably adapted to the production of bright tobacco of the cigarette and granulated pipe-smoking type, and is being extensively used for this crop in central North Carolina. The soil is very easy to till, warms up early in the spring, and responds freely to the application of fertilizers and manures. It needs more humus, and this can be had by turning under leguminous crops.

The following table gives the average results of analyses of soil and subsoil of Durham sandy loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.036	.011	.33	.16	1522	837	25106	12173
Subsoil }	.012	.01	1.23	1.61	697	194	23813	31170

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	6.3	23.7	17.1	17.4	14.0	17.9	3.8
Subsoil.....	4.6	12.4	11.2	16.7	12.1	17.7	25.5

DURHAM COARSE SANDY LOAM

This soil is quite similar to the Durham sandy loam. There are 3,200 acres of this land in the county. The largest bodies lie to the east of Concord, to the east of Kannapolis, and in the northwestern part of the county along Rocky River.

The surface soil is a gray to yellowish-gray loamy coarse sand with considerable fine white quartz gravel, or is composed of a fine sand, silt, and clay with quartz gravel and coarse sand. It is underlain at depths of about 10 to 24 inches by a yellow coarse friable sandy clay which grades into the rotten rock frequently at 24 inches below the surface. Flakes of mica are also seen in places.

It is developed on the nearly level to hilly and broken areas. The more level surface is seen east of Kannapolis, while the rougher areas occur along Rocky River. All of the type is excellently drained, due to

the open structure and coarse texture. This soil is deficient in vegetable matter, and it can best be supplied by turning under green manuring crops or adding large quantity of barnyard manure. This organic matter would render the soil more loamy and more retentive of moisture. Increased yields, particularly of corn, can be obtained where the soil is filled with humus.

The coarse sandy loam is adapted to the same crops and is now being used in the same way as the sandy loam. There is practically no difference in the agricultural value of the two types.

The following table gives the average results of analyses of soils and subsoils of Durham coarse sandy loam :

CHEMICAL ANALYSIS.

	Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P₂O₅)	Potash (K₂O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P₂O₅)	Potash (K₂O)	Lime (CaO)
Surface } 2 mm. {	.026	.091	3.68	.75	495	1731	69984	14265
Subsoil }	.014	.04	2.67	.89	1066	3043	203347	76255

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	12.9	18.1	12.4	23.2	8.2	19.2	5.8
Subsoil.....	9.5	11.1	8.1	15.6	12.1	21.1	22.2

MECKLENBURG CLAY LOAM

The Mecklenburg clay loam, commonly known as "red blackjack land," consists of 5 to 8 inches of reddish-brown loam to clay loam. Small rounded brown to black pebbles or concretions, and also a few quartz fragments, are seen on the surface. The subsoil is a yellowish-brown to reddish-brown sticky impervious clay to a depth of 20 to 36 inches, where it passes into the rotten rock and finally into hard bedrock.

There are 10,944 acres of this land in Cabarrus County. It occurs mainly in one large area in the southwestern part of the county, beginning about 2 miles southwest of Concord and extending to Harrisburg, being well developed around Patterson's Mill and Fairview Church. Its surface varies from nearly level to gently rolling. The more rolling portion has good drainage, but the more level areas require the construction of open ditches to carry off the excess rain water which is retarded in its downward movement by the impervious character of the heavy subsoil.

The Mecklenburg clay loam is considered one of the best soils in the county for the production of corn, wheat, oats, and Johnson grass. On some of the better drained areas alfalfa, clover, soy beans, and cow-peas would give good results. The yields of corn range from 15 to 40 bushels; wheat from 12 to 33 bushels; oats from 15 to 40 bushels, and cotton from $1\frac{1}{2}$ bale to 1 bale per acre. Better preparation of the seed-bed, better drainage, and the incorporation of vegetable matter in the soil are important factors towards securing larger yields.

The following table gives the average results of analyses of soil and subsoil of Mecklenburg clay loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of $6\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P_2O_5)	Potash (K_2O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P_2O_5)	Potash (K_2O)	Lime (CaO)
Surface } 2 mm. {	.055	.094	.159	.778	1100	1880	3180	15560
Subsoil }	.051	.264	.245	1.244	4080	21120	19600	99520

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	7.6	9.7	8.4	20.7	14.8	16.6	23.2
Subsoil.....	3.1	3.8	4.1	10.2	9.1	17.4	52.3

MECKLENBURG SANDY LOAM

This is the "red sandy blackjack land" comprising 6,464 acres. The largest areas of this soil are situated in the vicinity of Harrisburg and to the northwest of Patterson's Mill.

The surface soil is a dark brown to reddish-brown sandy loam of a depth of about 6 to 12 inches. A few small rounded iron pebbles, or concretions appear on its surface and give it a coarse feel and somewhat porous structure. The subsoil is a brownish-yellow or ochreous-yellow sticky heavy clay to a depth of 20 to 36 inches, where it grades into the soft rock. A few mica scales are seen locally, and also quartz fragments appear here and there.

It has undulating to gently rolling to rolling surface features, and possesses good natural surface drainage. The soil is easier to till and warms up earlier in the spring than the clay loam; also, cotton matures earlier than on the heavier "blackjack lands."

The usual crops of the county are grown with a fair degree of success. Cotton yields from $\frac{1}{2}$ to 1 bale per acre, depending upon fertilization methods and cultivation. Corn produces from 15 to 30 bushels, oats from 15 to 30 bushels, and wheat, cowpeas, and soy beans do well. The same fertilization and treatment is given this land as employed in handling the Mecklenburg clay loam.



FIG. 6.—A typical cotton mill scene

The following table gives the average results of analyses of soil and subsoil of Mecklenburg sandy loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6 $\frac{1}{2}$ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.076	.110	1.19	3.583	1494	2163	23395	70442
Subsoil }	.0345	.21	.60	5.26	2760	16800	48000	420800

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	10.5	12.7	8.5	18.1	13.2	20.1	16.7
Subsoil.....	3.3	5.3	5.4	14.3	11.6	17.9	42.1

IREDELL LOAM

The Iredell loam, generally known as "blackjack oak land" or "pipe-clay land," covers 22,528 acres. It and the fine sandy loam are distinguished from other soils by the putty-like character of the subsoils and the dominant blackjack oak growth.

The surface soil is dark gray to brown loam or heavy fine sandy loam, carrying a considerable quantity of small rounded iron concretions and extending to a depth of about 6 inches. Fragments of quartz and nigger-head rock are present on surface in a few localities. The subsoil is a brownish-yellow to light brown sticky impervious heavy clay to a depth of 24 to 30 inches, where it usually passes into the soft rotten rock.

The largest areas occur to the south of Harrisburg, north by Carrikers Store, to the southeast of Concord around Faggarts, and to the north of Mount Olive Church. Most of it has a fairly level surface. This fact, together with the dense nature of the subsoil, results in poor drainage over the flatter and more depressed areas. Open ditches serve well.

Most of the Iredell loam is fairly easy to cultivate. The difficulty comes in turning up much of the clay subsoil at any one time. Fall plowing, however, is good for this land, as the heavy clay crumbles down during the winter. The soil is well suited to the growing of wheat and oats, although corn and cotton do well when the soil has been limed and kainit added to correct the frencing of corn and the rusting of cotton. This is a good productive soil and one which is coming to be so recognized.

The following table gives the average results of analyses of soil and subsoil of Iredell loam:

* CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)		Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.049	.04	.131	.85	918	750	2455	15929
Subsoil }	.025	.034	.092	1.63	1986	2701	7308	129487

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	8.0	8.0	5.0	12.0	28.0	20.0	20.0
Subsoil.....	1.0	2.0	2.0	10.0	20.0	39.0	26.0

IREDELL FINE SANDY LOAM

This is the sandy "blackjack oak land" and is closely related to the Iredell loam. There are 13,312 acres of this soil scattered over the northwestern part of the county around Heilman's Mill, Cook's Crossing, Macedonia, north of Shiloh, and in the southern part of the county to the south of Harrisburg and west of Sherrill's Springs.

This soil is a dark gray or gray fine sandy loam having a depth of 8 to 10 inches. Small rounded black to dark brown iron concretions or pebbles are scattered over the surface and mixed with the soil. The subsoil is a sticky, waxy, impervious clay of a yellowish color, but turns brown on exposure to the air. Below 24 to 30 inches, this clay grades into a soft greenish yellow rock.

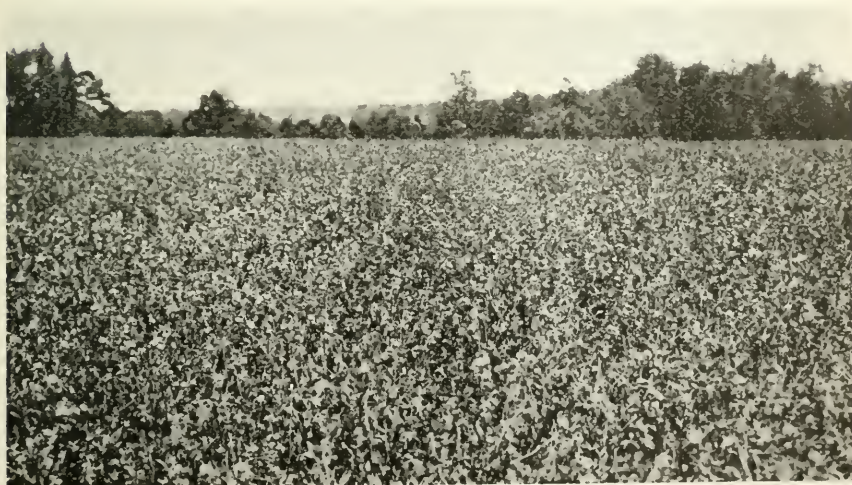


FIG. 7.—A field of red clover on Iredell loam type of soil

This Iredell fine sandy loam has a flat to rolling surface. The flat to gently rolling areas lie mainly in the western part of the county, along Coddle Creek, and are poorly drained, while its more rolling areas along Dutch Buffalo Creek have good surface drainage. It is a mellow soil and one easy to till where well drained. Wheat, oats, corn, and grasses do well, and Bermuda grass could be successfully grown for pasturage purposes. This soil is handled in practically the same way and requires similar fertilization as the Iredell loam.

The following table gives the average results of analyses of soil and subsoil of Iredell fine sandy loam :

CHEMICAL ANALYSIS.

		Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
		Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {		.0325	.102	.212	.53	614	1926	4003	10006
Subsoil }		.0340	.021	.177	1.56	2685	1658	13976	123178

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	2.6	7.0	10.5	28.3	16.9	26.2	8.5
Subsoil.....	1.0	2.0	3.1	10.2	10.7	20.2	52.7

ALAMANCE SILT LOAM

This type, together with the shallow phase, covers approximately one-seventh or 32,000 acres of the county. It is developed in large areas in the slate belt along the eastern and southeastern border of the county, joining the extensive area which reaches across Stanly and other counties.

The Alamance silt loam is locally called "white floury land" because of its mellow, smooth silty texture and whitish appearance. The first few inches of the surface is a light gray silt loam, passing into a pale yellow silt loam, which extends to a depth of 6 to 10 inches. The subsoil is a light yellow compact but friable silty clay loam to silty clay, usually passing into the rotten slate rock at 30 to 36 inches. Upon the flatter or slightly depressed areas the subsoil may show mottlings of light gray or drab, while on the ridges reddish colorations are seen. Small slate fragments and also a few quartz rocks occur on its surface in some localities, but not to such an extent as to interfere with cultivation.

The surface of this soil is prevailingly smooth and flat, with some rolling areas in the southern part of the county. With the exception of the more level areas all of it has fairly good natural drainage. Open ditches would serve every purpose for drainage. This soil, as its color indicates, is naturally deficient in organic matter. Owing to the fine texture of the soil and lack of vegetable matter, it is liable to bake and

run together. The turning under of green manuring crops, such as clover, cowpeas, or rye, or probably barnyard manure, would supply the needed vegetable matter, add nitrogen to the soil, and make it more loamy and more retentive of moisture, thus greatly increasing the yields. Deeper plowing and the addition of lime are also recommended.

The Alamance silt loam is best suited to the growing of wheat, rye, oats, corn, grasses, and cowpeas. Cotton yields are low, the average being about one-fourth or one-third bale per acre. Many of the bolls fail to mature. Sorghum cane, sweet potatoes, Irish potatoes, and garden vegetables can be profitably grown. Corn yields from 12 to 50 bushels, wheat from 8 to 20 bushels, oats from 12 to 30 bushels, and sweet potatoes from 40 to 100 bushels.

The following table gives the average results of analyses of soil and subsoil of Alamance silt loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.051	.063	.888	.206	964	1189	16807	3897
Subsoil }	.043	.127	1.340	.335	3333	9313	103344	25031

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	1.9	2.9	1.4	4.1	13.0	63.1	13.7
Subsoil.....	0.6	0.9	0.4	0.9	13.9	33.6	49.1

ALAMANCE SILT LOAM, SHALLOW PHASE

This shallow phase is shown on the map by cross lines on color of Alamance silt loam. It differs from that type in that the yellow silty clay subsoil extends to a depth of 10 to 20 inches where the underlying slate rock is reached. In places the rock occurs immediately under the surface soil, and even outcrops of it are common. Locally there is a considerable quantity of fine slate particles and quartz rock on the surface.

This phase lies within or joins the silt-loam type in the eastern part of the county. It occupies the more rolling areas of the slate belt and

along some of the streams the surface becomes broken. All of it is well drained, and the portions where the rock is nearest the surface are droughty. Much of the shallow phase is forested with white, red, post, and blackjack oaks, and some hickory, cedar, and dogwood. Practieally the camè crops are grown on this soil as upon the silt loam, but the yields are lower, and the soil is considered of low agricultural value.



FIG. 8.—Cultivating soy beans on Iredell sandy loam soil

ALAMANACE SLATE LOAM

There are 5,824 acres of this land within Cabarrus County. All of it is found in strips and irregular bodies in the extreme southeastern part of the county and along the Stanly County line.

This land is readily recognized by the presence of from 35 to 60 per cent of bluish-gray to gray slate fragments, usually angular and oblong and varying in length from 1 inch to several inches, scattered over the surface and mixed with the soil. Many outcrops of slate were observed, and these obstruct cultivation. The slate loam is a shallow soil, being underlain by broken slate rock at depths of from 8 to 15 inches. The slate fragments on the surface interfere with the cultivation of most crops. The soil is droughty and is excessively drained. Most of the type is forested to red, white, and post oak, with some hickory and dogwood. When not too slaty, patches of corn, oats, wheat, and cotton are grown.

The following table gives the average results of analyses of soil and subsoil of Alamance slate loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.101	.096	1.83	.30	2020	1920	36600	6000
Subsoil }	.042	.131	3.14	.101	3360	10480	251200	8080

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	8.9	6.0	2.5	4.8	7.9	53.8	16.2
Subsoil.....							

GEORGEVILLE SILT LOAM

This is the red soil of the slate belt, and covers 15,296 acres of the county. The surface soil is a light red to brown heavy silt loam, 4 to 6 inches deep, possessing a smooth floury feel. In wooded areas the first few inches of the surface may have a grayish or yellowish color. The subsoil is a dull or bright red silty clay of a tough but brittle structure. Frequently at 3 feet soft rotten varicolored slate rocks occur, and occasionally the red rock outcrops.

The Georgeville silt loam is confined to the eastern side of the county, where it occurs in long belts along Little Buffalo and Little Bear creeks and also along the lower portion of Rocky River in the southeastern corner. Its surface varies from practically level to gently rolling, and even rolling to hilly near the river. Natural surface drainage is well established, and rather excessively on the steeper slopes.

This soil is generally easy to till if handled under the proper moisture conditions; otherwise it is liable to bake slightly. The soil is susceptible to much improvement by the addition of barnyard manure or the turning under of green manures, deeper plowing, better preparation, and the application of lime.

Corn yields from 15 to 40 bushels; wheat from 10 to 20 bushels; oats from 15 to 35 bushels per acre. Cotton is grown to some extent, but the yields are generally low, due in part to early frosts in the slate belt.

The following table gives the average results of analyses of soil and subsoil of Georgeville silt loam:

CHEMICAL ANALYSIS.

Percentage Composition					Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phos- phoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.072	.076	1.394	.23	1440	1520	27880	4600
Subsoil }	.048	.072	1.85	.08	3840	5760	148000	6400

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	3.8	3.4	1.9	5.9	13.2	50.3	21.2
Subsoil.....	0.9	1.9	1.2	3.6	7.0	39.2	45.8

CONGAREE SILTY CLAY LOAM

This type represents 7,360 acres of fertile land developed in the first bottoms along the streams. It occurs in strips varying in width from a few yards to a half mile along Dutch Buffalo, Irish Buffalo, and Cold Water creeks and Rocky River. It occupies the low-lying flat lands only a few feet above the normal water level of the streams. Overflows are frequent when the land has not been reclaimed by canals.

The surface soil is a brown to reddish-brown silty clay loam with a depth of 15 to 30 inches, being smooth and working up into a good tilth. It is underlain by a brown silty clay. Both soil and subsoil contain small flakes of mica. Spots of fine sandy loam were included with the type in places along Cold Water and Coddle creeks. It is naturally one of the richest soils in the county, being composed of the fine sediments or so-called cream of the uplands which have been washed down and deposited along the streams. It is especially adapted to corn and grasses. Corn yields from 50 to 100 bushels per acre without fertilizer, while wild grasses flourish and make good hay or afford excellent pasturage for cattle during a large part of the year.

The following table gives the average results of analyses of soil and subsoil of Congaree silty clay loam:

CHEMICAL ANALYSIS.

	Percentage Composition				Pounds of Total Plant Food Constituents Per Acre. Surface Soil to Depth of 6½ Inches, 2,000,000 Lbs. Subsoil to Depth of 28 Inches, 8,000,000 Lbs.			
	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)	Nitrogen (N)	Phosphoric Acid (P ₂ O ₅)	Potash (K ₂ O)	Lime (CaO)
Surface } 2 mm. {	.093	.122	1.12	1.07	1860	2440	22400	21400
Subsoil }	.075	.111	.953	2.21	6000	8880	76240	176800

MECHANICAL ANALYSIS.

	Fine Gravel, Per Cent	Coarse Sand, Per Cent	Medium Sand, Per Cent	Fine Sand, Per Cent	Very Fine Sand, Per Cent	Silt, Per Cent	Clay, Per Cent
Surface soil.....	0.0	0.3	0.3	1.9	13.2	56.4	27.9
Subsoil.....	0.0	0.0	0.9	8.1	28.6	35.4	26.8

MEADOW

The term "Meadow" is applied to the bottom-lands along some of the creeks and branches. The soil is variable in texture and color, ranging from a loose gray sand to a brown mellow silt loam or clay. It is constantly being changed by the depositions of sediments washed down from the hills or by the removal of material in the bottoms.

All of it is subject to frequent overflow, and very little of it is used for the production of crops. With the exception of the sand areas, this land would give good yields of corn and grass. Some of it is devoted to pasturage purpose for summer grazing of cattle. Hay of an excellent quality is grown on some of the meadow. Much of this land could be drained, reclaimed, and rendered very productive. There are 4,376 acres of Meadow in Cabarrus County.

STORE OF PLANT-FOOD IN THE SOILS OF THE COUNTY

The chemical examination of the soils of this county has shown in a general way that nitrogen and phosphoric acid are the plant-food constituents that are contained in smallest amounts. This has generally been the findings, too, with reference to most of the soils occurring in other counties of the Piedmont section of the State, the soils of which have been examined by us.

The soils of this county that show the largest content of nitrogen are Alamance Slate Loam, Congaree Silty Clay Loam, Cecil Clay, Cecil Clay Loam, Mecklenburg Sandy Loam, Georgeville, Silt Loam, and Mecklenburg Clay Loam; those showing the smallest amounts of this constituent at the present time in the soil are Cecil Sandy Loam, Durham Coarse Sandy Loam, Iredell Fine Sandy Loam, Cecil Coarse Sandy Loam, Durham Sandy Loam, Cecil Fine Sandy Loam, Iredell Loam, and Alamance Silt Loam types, in the order given.



FIG. 9.—Improving land by growing velvet beans in the rows of corn

Phosphoric acid is contained in highest amounts in the soils of the county in the order given: Cecil Fine Sandy Loam, Congaree Silty Clay Loam, Mecklenburg Sandy Loam, Iredell Fine Sandy Loam, Alamance Slate Loam, Mecklenburg Clay Loam, and Durham Coarse Sandy Loam; and lowest with Durham Sandy Loam, Cecil Sandy Loam, Iredell Loam, Cecil Coarse Sandy Loam, Alamance Silt Loam, Cecil Clay, Georgeville Silt Loam and Cecil Clay Loam. The Cecil Fine Sandy Loam, Congaree Silty Clay Loam, Mecklenburg Sandy Loam, and Iredell Fine Sandy Loam are higher, generally speaking, in content of phosphoric acid than most other Piedmont soils of their series. Particularly is this so in the case of the Cecil Fine Sandy Loam type.

In potash content the soils of this county, as of other counties located in the Piedmont section of the State, are generally relatively high. Those containing this constituent in the largest amounts are Cecil Fine Sandy Loam, Cecil Coarse Sandy Loam, Durham Coarse Sandy Loam, Alamance Slate Loam, Cecil Sandy Loam, Cecil Clay Loam, and Georgeville Silt Loam. The Cecil Fine Sandy Loam and Cecil Coarse Sandy Loam contain more than 4 per cent of potash, and the Durham Sandy

Loam contains more than 3½ per cent. Those lowest in this constituent are Iredell Loam, Cecil Clay, Mecklenburg Clay Loam, Iredell Fine Sandy Loam, Durham Sandy Loam, Alamance Silt Loam, Congaree Silty Clay Loam, and Mecklenburg Sandy Loam types, in the order given.

In calcium content, the Mecklenburg Sandy Loam type is decidedly higher than any other soil type occurring in the county. Other types of the county containing highest amounts of calcium are Congaree Silty Clay Loam, Iredell Loam, Mecklenburg Clay Loam, Durham Coarse Sandy Loam, Cecil Fine Sandy Loam, and Iredell Fine Sandy Loam. Those containing the smallest amount of calcium are Cecil Clay Loam, Durham Sandy Loam, Cecil Sandy Loam, Alamance Silt Loam, Georgeville Silt Loam, Cecil Coarse Sandy Loam, Alamance Slate Loam, and Cecil Clay.



FIG. 10.—Improving the land by growing corn and cowpeas in alternate rows

WHAT EXPERIMENTS HAVE SHOWN TO BE THE CHIEF NEEDS OF THE SOILS

The results of field experiments that have been conducted for three years on Mecklenburg Clay Loam type in this county, and for a number of years on the Cecil Clay Loam type in Gaston County, on Cecil Clay and Iredell Loam in Mecklenburg County, and on Cecil Clay Loam in Iredell County, have shown as an average that, generally speaking, nitrogen and phosphoric acid are the plant-food constituents generally needed by most of the soils occurring in the county. Nitrogen is especially essential at this time. Applications of potash have not generally been found to be absolutely essential for general crops, such as small grains, corn and cotton, in order to be assured of good yields. Where kainit has been used on cotton that is subject to rust, with such

good results the weight of evidence is that the chief value has been from the common salt which the kainit contains in large quantities. Average kainit will contain from 30 to 40 per cent of this material. Ordinary waste meat salt used at the rate of 400 to 600 pounds per acre has been found in experimental work to greatly reduce this trouble with cotton.

It is more than probable that for such crops as tobacco, potatoes, and legumes, applications of potash, when prices are normal, will in many cases, at least, prove to be profitable. Especially is this so when the soils are low in organic matter, notwithstanding fairly good crops might be grown without such applications. In experiments on the Alamance Silt Loam type of soil near Monroe in Union County, the soil being fairly low in organic matter, it has been found that the use of potash when obtainable at normal prices has increased the yields of an oat-and-vetch mixture for hay, and of seed cotton in sufficient amounts to justify its use. It is believed that with the organic matter supply materially increased in this soil, as well as other types of soil occurring in the county, the necessity for applications of potash may not be in many cases necessary in order to secure good yields.



FIG. 11.—This grass mixture will do well on the soils of the county, if properly put in and manured

With all the main types of soil occurring in the county when they are low in organic matter, nitrogen has been shown to be of chief importance. Upon increasing the amount of organic matter in the soil the necessity for applications of materials carrying nitrogen in available form is greatly reduced. All the soils of the county, types of which have been examined chemically, are low in nitrogen and organic matter, and

field tests have shown applications of nitrogen in available form to give splendid increases in yields of crops.

The phosphoric acid contained in the Cecil Fine Sandy Loam, Congaree Silty Clay Loam, Mecklenburg Sandy Loam, and Iredell Fine Sandy Loam types is sufficiently high to lead to the belief that when these soils are handled in such a way as to embrace in them considerable amounts of organic matter, the necessity for the use of applications of materials carrying phosphoric acid will not be as pressing as it is at the present time. Particularly is this so with the Cecil Fine Sandy Loam type, which contains almost 0.2 per cent of phosphoric acid in the surface soil. This is very high when compared with most other Piedmont soils. In experiments in Mecklenburg County on the Iredell Loam type of soil it has been found that applications of phosphoric acid do not increase the yield at all. There is every reason to believe that the Iredell Loam type of this county will show need for this constituent as the quantity of phosphoric acid in the soil of this type in Cabarrus County, on an average, is about one-seventh of the same type occurring in Mecklenburg County. As a matter of fact, the Iredell Loam of this county is one of the very lowest in total content of phosphoric acid.

Judging from the chemical analyses of the soils of different types found in the county, as well as from such other information as we have with reference to them, it is felt that in a general way nitrogen and phosphoric acid are the two controlling plant-food constituents at the present time in crop production, so far as soil fertility is concerned. In a general way the field results, too, point in the same general direction as to the needs of the soils of the county. The incorporation of organic matter is of the highest importance, as, generally speaking, the percentage of this constituent in the soils is relatively low. When leguminous crops and other cover crops are grown on the soils of the county and plowed in to increase its organic-matter supply, it will be found that in most cases a fairly liberal use of lime will be essential for the best and most profitable returns. Our experiments generally, conducted in the Piedmont section of the State, indicate that lime is essential to be added where a proper system of crop rotation is practiced and organic matter is plowed into the soil.

HOW TO SUPPLY PLANT-FOOD REQUIREMENTS

NITROGEN—Soils showing a need for applications of nitrogen or ammonia, as they do in this county, can usually be considered as deficient in organic matter, and when the organic matter is high in any soil it may generally be inferred that such soil is relatively well provided with nitrogen.

Analyses and field results have shown that the soils of this county are generally low in nitrogen. One of the main problems, therefore, for the farmers will be to supply this constituent in fairly liberal quantities to the soil and do it as cheaply as possible. The chief means that must be used in supplying the nitrogen will be by the growing of

suitable leguminous crops, properly inoculated, on the land and turning all or part of these into the soil. By the use of such a plan not only will the supply of nitrogen and organic matter be increased, but the physical properties of the soils will be greatly improved by the addition of the organic matter to such an extent that "baking" would be greatly reduced after rains and plowing be made easier and much more satisfactory.

Other materials that may be depended upon to supply the needs of the soils of the county are farm manures and commercial fertilizers. The commercial materials that carry moderate or high percentages of nitrogen are usually expensive. It is frequently difficult to have low-priced products like corn pay well for other than moderate applications of farm manures. Of course, when corn is selling at as high prices as it is at the present time much larger amounts, when properly used, may be added to advantage. Where a crop like cotton is grown and the prices secured for the seed and lint are fair to high, farmers will find, usually, that the use of commercial forms of nitrogen in proper amounts may be used profitably, provided they are combined with other materials that will supply the other needs of the crop when it is grown on any particular soil type.

Where grains or grasses are grown mainly, other sources of nitrogen than commercial ones will generally have to be depended upon to a large extent. Barnyard manure furnishes one of the most desirable sources of this constituent, as combined with it are large amounts of organic matter and moderate amounts of phosphoric acid and potash. This material, however, is not very well balanced in plant-food constituents to meet the requirements of the soils of the county. It will, therefore, have to be supplemented by materials carrying the required constituents needed by the soils, the chief of which will be phosphoric acid, when a sufficient amount of manure is added to provide for the nitrogen needs. As valuable as barnyard manure may be, it cannot be solely depended upon by farmers generally to keep up the organic matter and nitrogen supply of their soils, as the amount produced on the average farm is relatively small as compared with the acreage devoted to the growing of crops.

PHOSPHORIC ACID — This constituent is contained in very small quantities in the Durham Sandy Loam and Cecil Sandy Loam types. It is not high in any of the types of soil except those mentioned above.

With the farmer it will generally be necessary, in order that his profits may be greater, for him to use phosphoric acid applications on crops grown on most of the types of soil of the county. Particularly will this be so with those soils low in phosphoric acid. Taking everything into consideration, the two common forms that will have to be depended upon largely at the present time to supply available phosphoric acid will be acid phosphate and basic slag. Of course, there will be added to the

soil a considerable amount of phosphoric acid when liberal amounts of manure, cotton-seed meal and soy-bean meal, and ground bone are used alone or in such materials as tankage or fish scrap.

Where large amounts of organic matter are being turned back into the soil, in many cases it may be profitable to use finely ground phosphate rock at the time the material is being turned in. The organic matter in rotting will tend to bring into available form some of the phosphoric acid contained in this phosphatic material. Again, a plan that in many cases would appear to be practical would be to add finely ground phosphate rock to manure in stables as the manure is being formed, using the rock at the rate of 1 to 2 pounds per day broadcast over the manure, twice per week.

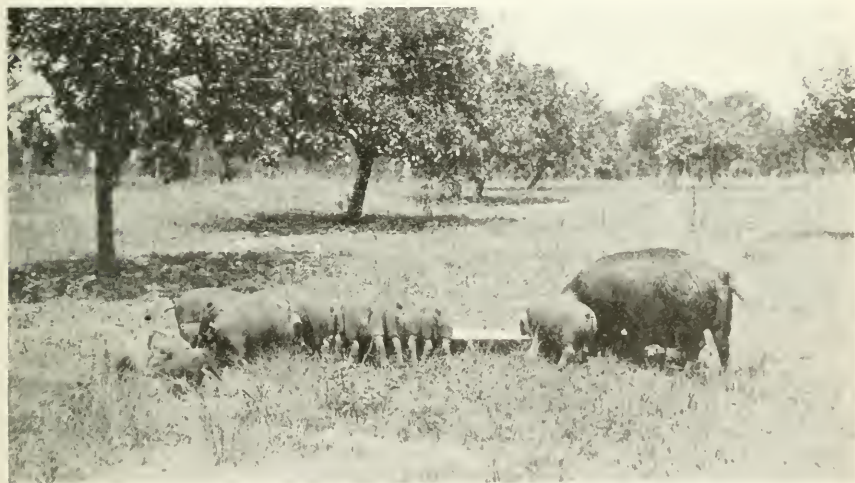


FIG. 12.—The kind of pigs that can be produced in this county

POTASH—With soils of this county, as well as with Piedmont soils generally, the least important constituent to be added of the main plant-food constituents at the present time has been found to be potash. As a matter of fact, from the standpoint of potential plant-food it would appear beyond doubt that potash is far less important than is phosphoric acid and nitrogen to be applied. None of the soils contain less than 0.13 per cent, while the Cecil Fine Sandy Loam and Cecil Coarse Sandy Loam contain over 4 per cent and the Durham Coarse Sandy Loam almost 3.7 per cent potash. Speaking generally, the soils of the county contain enough potash in them for the growth of maximum crops for a number of years to come, but it is not present at the present time, apparently, in large amounts in soluble form. It is generally, with the soils of this county as well as most other Piedmont counties, more of a problem of making the supply present available than of increasing it by the addition of fertilizing materials supplying this constituent. Par-

ticularly is this so when the crops grown are of a nonleguminous type. When the price of potash is as high as it is at the present time, its use will not usually be found to pay on the ordinary crops, such as corn, cotton, and small grains.

LIME—When the main crops of the county, like cotton and small grains, are grown continuously on the land, as is frequently done, without the turning in of leguminous crops or crop residues or the addition of organic matter in other ways, lime will not usually be found to give much increase at the present time. However, when cover crops are used, as they should be on all soils of the county, especially those low in organic matter, lime will generally be found to be essential for most favorable returns. Even with soils high in calcium like the Mecklenburg Sandy Loam, it will no doubt prove beneficial to make applications of lime, as the calcium of this type of soil is largely, if not entirely, combined in the form of silicates which do not act in this combination in the same beneficial way as does the calcium contained in ground limestone and other agricultural forms of lime. It is suggested that in plowing up the soils of the county, from one to two tons of ground limestone, shells, or marl, or the equivalent in some other form of lime, be added. Many of the soils of the county are acid, and in order to overcome this acidity, make them sweet and favorable for the growing of leguminous crops, it will be necessary to use lime.

FERTILIZER MIXTURES TO USE FOR DIFFERENT CROPS

For the average types of soil occurring in the county low in phosphoric acid it is recommended that for cotton 400 to 600 pounds of a mixture containing 10 to 12 per cent available phosphoric acid and 2½ to 4 per cent ammonia be used. When the price of actual potash is not greater than 5 to 6 cents per pound it will in most cases prove profitable to use at least 2 per cent of this constituent. However, when the price of potash is as high as it is at the present time, it will not generally be found to pay with such crops as corn, cotton, and small grains; certainly not if a proper system of crops is used. A mixture that will give approximately the proportion indicated above is as follows:

Acid phosphate, 16 per cent.....	400 pounds
Cotton-seed meal, 7½ per cent.....	200 pounds
<hr/>	
Total	600 pounds

Dried blood, fish scrap, sulphate of ammonia, or nitrate of soda may be substituted for the cotton-seed meal in the mixture. In making the substitution it may be done by using 47 pounds of blood, 75 pounds of fish scrap, 30 pounds of sulphate of ammonia, or 42 pounds of nitrate of soda for every 100 pounds of cotton-seed meal in the mixture.

If especially desired on the more open sandier soils of the county, one-third to one-half of the nitrogen may be put in at the time the crop is planted in the form of some organic combination such as cotton-seed meal, dried blood, or fish scrap, reserving the other half to two-thirds to be applied as a side-dressing in the form of sulphate of ammonia or nitrate of soda about the first of July with crops planted in the spring. It is believed that materials carrying phosphoric acid and potash generally had best go on at the time the crop is planted.

For corn, small grains, grasses, and sorghum grown on the average soils of the county, except those high in phosphoric acid, from 250 to 400 pounds per acre of a mixture containing 10 to 12 per cent available phosphoric acid and 5 to 6 per cent ammonia will give good returns. Where leguminous crops, stable manure, or other materials carrying organic matter fairly rich in nitrogen go back into the soil, the amount of nitrogen in the mixture might be reduced one-third to one-half or more. Potash up to $1\frac{1}{2}$ to 2 per cent in the mixture may be expected to pay when this constituent is selling at normal prices. A mixture that will give approximately the right quantities of nitrogen and phosphoric acid for average soils of the county, with exception noted, is as follows:

Acid phosphate, 16 per cent.....	200 pounds
Cotton-seed meal, $7\frac{1}{2}$ per cent.....	200 pounds
	<hr/>
Total	400 pounds

Here, as above, the other recognized stable carriers of nitrogen may be substituted for the cotton-seed meal in the proportions indicated.

For clovers, cowpeas, soy beans, and other leguminous crops 300 pounds of 16 per cent acid phosphate per acre, with an application of lime every four to five years, will usually be found satisfactory on soils containing a moderate amount of organic matter. This quantity may in many cases be increased to 500 pounds per acre to good advantage. Potash-supplying materials can be used on most of the soils to good advantage when the price of this constituent is normal. We would not think it necessary to use more than 3 to 4 per cent of potash in the mixture for these crops, even when potash is cheap.

In case the land is very poor or very low in organic matter, so that young plants do not start off well, a sufficient amount of cotton-seed meal, dried blood, or other nitrogen-furnishing material must be added, which will supply nitrogen in the mixture up to 1 to 3 per cent. When 300 to 500 pounds of 16 per cent acid phosphate is used on such soils, 50 to 75 pounds of cotton-seed meal or its equivalent in nitrogen-content of dried blood or other suitable carrier of this constituent may be used usually to good advantage. If it is discovered after the plants have gotten started that nitrogen is needed, as will be indicated by small, slow growth, and pale, sickly appearance, the land being well drained, a top-

dressing of 50 to 75 pounds of nitrate of soda per acre may be applied. When the plants are free from rain or dew, this will usually be found to be profitable.

With the high or moderately high phosphoric acid soils, the amounts of phosphoric acid in the fertilizer mixture might in many cases be reduced. Especially would this be so when the organic-matter supply of these soils has been materially increased.



FIG. 13.—Bee-keeping is one of the most important of the smaller industries of the home.

With all the mixtures given above, as the amount of organic matter turned back into the soil is increased, especially that from leguminous crops that are being grown on the land with the formation of nodules on their roots, the amounts of cotton-seed meal and other nitrogenous fertilizing materials required in the fertilizer mixtures to give most profitable returns may be materially reduced. In fact, when the supply has become liberal in the soil it might possibly be entirely left out of the fertilizer mixture in nitrogen-carrying material. It should be the aim of every farmer in the county, as nearly as practicable, to obtain this condition with his soils, for under normal conditions nitrogen is the constituent that is most expensive and the one that is most elusive, and thereby easily lost from the soil when the conditions in the soil are not just right.

CROP ROTATION NECESSARY FOR A PERMANENT SYSTEM OF AGRICULTURE IN THE COUNTY

It is the duty of every owner of farm lands in this county, as well as of other counties in the State, to follow methods of crop rotation and fertilization that shall at least maintain the producing power of the soils and build up those that are yielding only small returns at the pres-

ent time. At the same time the treatment should be such as to give good substantial financial returns on the investment. The method in common use by farmers should be such that their soils would become more productive from year to year. The investigations that have been conducted by the Division of Agronomy in previous years have been carried on primarily to determine the most economical methods of fertilizing the various soil types in this and other counties of the State and at the same time to take the information thus secured and apply it in conjunction with systems of crop rotation found suited for different conditions for the purpose of helping the farmer increase the producing power of his soils. From information thus far secured we are able to recommend methods which if followed by the farmers of Cabarrus County will maintain their soils in a far more productive condition than they are at the present time.

In providing the necessary plant-food constituents as recommended above for the different soils it is necessary to adopt good systems of crop rotation, if the best and most profitable returns per acre are to be secured. The following rotations are recommended as well adapted for conditions prevailing in the county:

First Year—Corn with soy beans or cowpeas drilled in the row at planting or before the first cultivation. They may be broadcasted just before the last cultivation if this is more desirable.

Second Year—Wheat or oats, followed by red clover, spring seeding.

Third Year—Red clover.

This is a short rotation, admirably adapted for use by the grain farmers of the county. It will be essential to use lime where red clover is seeded in order to be sure of success. The corn stover and wheat straw from such a rotation should be plowed in or be fed to stock and the manure carefully saved and returned to the soil. The soy beans or cowpeas and the last crop of red clover in the third year should be turned in to add to the organic matter and nitrogen supply of the soil. In starting this rotation on average soils of the county, use the fertilizing mixture given above for leguminous crops. If available, farm manure may be used with acid phosphate. In that case, if the application is fairly liberal, the necessity for applying nitrogen in the fertilizer mixture will be materially reduced or entirely done away with.

During the first year that wheat or oats are grown on the land, they should receive the treatment indicated above for corn. In addition to the acid phosphate it would be well to apply 200 to 400 pounds of rock phosphate, as this fertilizer is for both the wheat and clover crop that is to follow. An application of 600 to 800 pounds per acre of rock phosphate to a good crop of red clover at the time or just before it is turned into the soil might furnish much of the phosphoric acid required by the crops of the second period of the rotation. Within a comparatively short time enough nitrogen should be furnished by the soy beans or cowpeas, the clover, and the roughage or stable manure, if the crops

are good and the manure saved and applied back on the land or plowed directly into the soil after maturity. The application of rock phosphate and lime should be made every four to five years. Live-stock farming in connection with this rotation might help in improving the productivity of these soils if the manure is properly saved and applied back on the soil.

FOUR-YEAR ROTATIONS

A good four-year rotation is the same as above, with oats and soy beans or cowpeas following the corn the second year.

Other four-year rotations which could be adopted in this county are:

First Year—Corn, crimson clover.

Second Year—Crimson clover and cowpeas or soy beans.

Third Year—Wheat and oats, red clover.

Fourth Year—Red clover.

Or, for sections of the county in which cotton is grown, one similar to this might be used:

First Year—Corn, wheat or oats.

Second Year—Wheat or oats, red clover.

Third Year—Red clover.

Fourth Year—Cotton, rye.

A similar method of fertilization should be adopted with these four-year rotations as is given for the three-year rotation.

FIVE- OR SIX-YEAR ROTATIONS

Any of these rotations with two years of pasture added would make them even better adapted to live-stock farming. Where it is desired to grow cotton, the following six-year rotation should, under an intelligent supplemental system of fertilization and proper cultivation, give good results:

First Year—Corn, with cowpeas in the row or sown just before the last cultivation.

Second Year—Cotton, with rye sown broadcast in the cotton after the first picking and covered with a harrow or light cultivator.

Third Year—Rye plowed under, cowpeas, wheat or oats.

Fourth Year—Wheat or oats, red clover.

Fifth Year—Red clover.

The fertilizer, here, too, would be similar to that indicated above for a three-year rotation.

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FERTILIZER ANALYSES

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ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917. MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory	
				Available Phosphate	Water-soluble Nitrogen	Organic Nitrogen	Equivalent to Ammonia	Total Potash		
Brands claiming										
379	American Agricultural Chemical Co., Henderson, N. C.	Ellis Brand 8-2-2	Henderson	8.00	82	.92	1.65	2.00	2.17	\$24.93
392	American Agricultural Chemical Co., New York, N. Y.	Detrick's Rival Tobacco Compound	Roxboro	8.18	.84	.66	1.74	1.82	2.11	26.34
420	Baugh & Sons Co., Norfolk, Va.	Baugh's Old Standby Compound for Tobacco.	Burlington	8.00	84	.62	1.50	1.75	2.06	23.05
466	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 8-2-2 Guano, Standard Grade.	Statesville	8.15	1.11	.46	1.76	2.14	2.00	25.84
454	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Butcher Bone	Greensboro	8.22	.88	.42	1.34	1.63	1.49	21.30
390	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano for Tobacco	Senora	7.83	1.12	.66	1.54	1.87	1.67	22.65
463	Georgia Chemical Works, Charlotte, N. C.	Georgia Formula	Statesville	7.79	1.04	.46	1.70	2.07	1.97	24.78
452	Imperial Company, Norfolk, Va.	Imperial Standard Premium Guano	Reidsville	9.10	1.22	.76	1.68	2.04	1.82	25.26
451	do.	Imperial Tobacco Guano	Pelham	8.20	.86	.44	1.62	1.97	1.83	24.15
418	Navassa Guano Co., Wilmington, N. C.	Oceaneehoe Tobacco Guano	Haw River	9.16	1.24	.52	1.68	2.04	1.61	24.27
449	do.	do.	Reidsville	7.65	1.24	.56	1.74	2.11	2.05	25.04
387	Norfolk Fertilizing Co., Norfolk, Va.	Oriana Tobacco Guano	Roxboro	8.24	1.18	.62	1.72	2.09	1.89	25.80
388	N. C. Farmers Union, Statesville, N. C.	N. C. Farmers Union Tobacco Guano	do.	8.62	1.10	.62	1.60	1.94	1.89	25.29
416	Ober, G., & Sons Co., Baltimore, Md.	Standard Tobacco Fertilizer	Mebane	8.08	.98	.84	1.88	2.29	1.90	24.25
373	Old Buck Guano Co., Richmond, Va.	Old Buck Saxon Tobacco	Henderson	8.25	1.04	.70	1.72	2.09	1.90	25.65
415	Patapasco Guano Co., Baltimore, Md.	Planters' Favorite	Mebane	7.66	1.02	.60	1.78	2.16	1.92	24.63
285	do.	Seagull Ammoniated Guano	Roxboro	8.42	1.18	.58	1.70	2.07	1.91	25.50
450	Pamlico Chemical Co., Washington, N. C.	Pamlico Bone and Fish Guano	Stokesdale	8.44	1.12	.64	1.66	2.02	1.81	25.13
372	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Guano	Kittrell	8.37	1.02	.66	1.66	2.02	1.84	24.39
383	do.	do.	Senora	8.47	1.00	.70	1.74	2.11	1.89	24.64
460	Richmond Guano Co., Richmond, Va.	Premium Brand Fertilizer	Cherryville	8.56	1.04	.54	1.66	2.02	1.32	22.55
413	Swift & Co. Fertilizer Works, Wilmington, N. C.	Swift's Red Steer for Tobacco	Effland	8.98	1.12	1.06	1.64	1.99	1.84	24.14

84	Tascorora Fertilizer Co., Greensboro, N. C.	Tascorora Standard Tobacco Grower.	Greensboro.	8.53	.75	.76	1.51	1.84	1.98	24.77
79	Union Guano Co., Winston, N. C.	Fish Brand Ammoniated Guano.	do.	9.06	.57	.80	1.37	1.67	1.41	21.86
445	do.	Fish Brand Ammoniated Guano for Tobacco.	do.	9.77	.98	.58	1.56	1.89	2.11	26.87
407	do.	Old Honesty Guano.	Spikeville.	9.91	1.22	.40	1.62	1.97	1.80	25.71
380	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Anchor Brand Fertilizer.	Roxboro.	7.97	1.14	.50	1.64	1.99	2.06	25.16
444	do.	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	Stokesdale.	9.20	1.20	.60	1.80	2.19	2.10	27.26
367	do.	Old Dominion Guano Co.'s Soluble Guano.	Wake Forest.	7.82	1.50	.58	2.08	2.53	2.12	27.16
381	do.	S. W. Travers & Co.'s National Special Tobacco Fertilizer.	Roxboro.	8.18	1.06	.54	1.60	1.94	1.94	24.60
391	Brands claiming American Agricultural Chemical Co., New York, N. Y.	Slingluff's British Mixture.	Roxboro.	8.00	---	---	2.06	2.50	2.00	26.65
421	American Fertilizer Co., Norfolk, Va.	Bob White Fertilizer for Tobacco.	Burlington.	8.11	1.10	1.02	2.12	2.58	2.08	27.41
414	Brand claiming Royster, F. S., Guano Co., Norfolk, Va.	Royster's Orinoco Tobacco Guano.	Mebane.	8.31	1.56	.52	2.08	2.53	2.97	31.90
431	Brand claiming Imperial Fertilizer Co., Norfolk, Va.	Pelican Crop Grower.	Greenville.	8.00	---	---	2.26	2.75	2.00	27.49
306	Union Seed and Fertilizer Co., Wilmington, N. C.	U. S. and F. Co., Brand No. 6.	Chadbourn.	8.00	---	.12	2.38	2.89	1.70	28.20
412	Brands claiming American Agricultural Chemical Co., Henderson, N. C.	Standard Fertilizer.	Zebulon.	8.37	.48	1.02	2.10	2.55	.64	20.39
405	American Fertilizer Co., Norfolk, Va.	Guano Revised.	Wadesboro.	8.00	---	---	2.47	3.00	1.00	23.37
455	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Choice.	Greensboro.	9.52	1.62	1.22	2.84	3.45	1.40	28.45
409	Farmers Cotton Oil Co., Wilson, N. C.	F. C. O. Co.'s S. M. Mixture.	Zebulon.	9.61	1.48	.82	2.30	2.80	.99	21.22
374	Navassa Guano Co., Wilmington, N. C.	Special 3 Per Cent Guano.	Franklinton.	7.91	1.74	.60	2.34	2.84	.99	22.69
389	N. C. Farmers' Union, Statesville, N. C.	N. C. Farmers' Union Guano.	Roxboro.	8.30	.64	1.38	2.02	2.46	.74	20.48
271	Powhatan Chemical Co., Richmond, Va.	Hustler Tobacco Special.	Wilson.	7.86	1.30	.78	2.08	2.53	1.22	22.69
474	do.	do.	Macon.	7.89	1.16	1.22	2.38	2.89	1.20	23.89
382	Va.-Car. Chemical Co., Richmond, Va.	Old Dominion Co.'s Farmers' Friend High Grade Fertilizer.	Roxboro.	7.86	1.70	.68	2.38	2.89	1.28	24.26
419	Brand claiming Navassa Guano Co., Wilmington, N. C.	Clarendon Tobacco Guano.	Haw River.	8.04	1.30	1.02	2.32	2.82	1.03	22.93
2853	Pearson & Co., Wilmington, N. C.	Pearson's Use Me Guano, High Grade.	Kerr.	8.33	1.50	1.24	2.74	3.33	1.06	25.14
				8.00	---	---	2.47	3.00	2.00	28.37
				8.02	1.66	.76	2.42	2.94	1.93	27.82
				8.17	1.04	1.40	2.44	2.97	1.95	28.17

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory		
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash			
Brands claiming												
376	American Fertilizer Co., Norfolk, Va.	J. G. Miller & Co.'s Yellow Leaf Fertilizer.	Wake Forest.	8.00					2.47	3.00	3.00	\$33.37
375	Brown, H. P., Guano Co., Salisbury, N. C.	8-3-3 Tobacco Guano, High Grade.	Henderson	7.86	1.54	.88	2.42	2.94	2.62	3.00	2.62	31.12
408	Patapsee Guano Co., Baltimore, Md.	Chippewa Guano.	Zebulon	8.62	1.04	1.08	2.12	2.58	2.55	3.00	2.55	30.27
368	Swift & Co. Fertilizer Works, Wilmington, N. C.	Swift's Carolina Tobacco Guano, High Grade Guano.	Kittrell	8.48	1.76	.70	2.46	2.91	2.76	3.00	2.76	32.61
				9.03	1.22	1.02	2.24	2.72	2.66	3.00	2.66	31.74
303	Va.-Car. Chemical Co., Richmond, Va.	Va.-Car. Chemical Co.'s Menhaden Fish and Meal Mixture.	Mount Tabor.	8.38	1.22	.94	2.16	2.63	2.90	3.00	2.90	31.95
Brand claiming												
250	Union Seed and Fertilizer Co., Wilmington, N. C.	Brand No. 15.	Parkton.	8.00					3.29	4.00	1.00	26.82
				8.66	.54	2.50	3.04	3.71	1.02	2.65	26.53	
Brand claiming												
354	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Gothic Truck Compound	Elizabeth City.	8.00					4.11	5.00	1.00	30.26
				7.87	3.10	1.00	4.10	4.98	1.49	32.54		
Brands claiming												
384	Pocomoke Guano Co., Norfolk, Va.	Pocomoke 2-9-1 Fertilizer.	Semora.	9.00					1.65	2.00	1.00	20.93
				9.65	.98	.76	1.74	2.11	.93	21.61		
459	Richmond Guano Co., Richmond, Va.	Premium Cotton Special	Cherryville.	9.37	1.12	.48	1.60	1.94	1.22	22.19		
97	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special for Tobacco.	Reidsville.	10.86	.95	.84	1.79	2.18	.93	23.03		
395	Union Guano Co., Winston, N. C.	Union Quality and Quantity Guano.	Shelby.	10.25	.68	.30	.98	1.19	1.04	19.57		
				9.00			1.65	2.00	2.00	25.93		
447	Peeahontas Guano Co., Lynchburg, Va.	Yellow Tobacco Special.	Brown Summit.	9.30	1.14	.56	1.70	2.07	1.97	26.29		
Brand claiming												
495	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Colonial Tobacco Guano.	Creedmoor.	9.00					2.06	2.50	2.00	27.65
				8.71	1.72	.60	2.32	2.82	2.21	29.50		
Brand claiming												
406	Va.-Car. Chemical Co., Richmond, Va.	White Stem C. S. M.	Spikeville.	9.32	1.16	1.04	2.20	2.67	2.10	29.06		

Brand claiming			9.00	2.08	2.47	3.00	2.00	29.37
497	American Agricultural Chemical Co., New York, N. Y.	Gold Eagle Tobacco Fertilizer	9.80	.52	2.60	3.16	1.93	30.37
Brand claiming								
446	Union Guano Co., Winston, N. C.	B. S. Ammoniated Guano	9.00		.82	1.00	3.00	27.44
Brand claiming			9.38	.16	.70	1.05	2.50	25.49
386	Ober, G., & Sons Co., Baltimore, Md.	Ober's Red Indian Tobacco	10.00		1.65	2.00	1.00	21.93
Brand claiming			9.74	.98	.96	1.14	1.27	24.29
408	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Pride	6.00		3.29	4.00		19.12
430	Columbia Guano Co., Norfolk, Va.	Columbia Battery Ammoniated Phosphate.	6.09	2.90	.48	3.38	4.11	20.29
439	Eastern Cotton Oil Co., Hertford, N. C.	O. W. C. Special	6.14	2.16	.98	3.14	3.82	19.33
400	Read Phosphate Co., Charleston, S. C.	Read Blood and Bone Mixture	5.57	.98	1.84	2.82	3.43	17.41
Brand claiming			6.59	1.68	1.12	2.80	3.40	18.35
435	Va.-Car. Chemical Co., Richmond, Va.	Va.-Car. Chemical Co.'s 6-5-0 Ammoniated.	6.00		4.17	5.07		23.51
Brand claiming			6.52	3.38	1.02	4.40	5.35	25.00
351	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 3 Per Cent Ammoniated Phosphate.	7.00		4.11	5.00		24.26
Brands claiming			6.97	2.98	1.10	4.08	4.96	24.11
442	Acme Mfg. Co., Wilmington, N. C.	Acme 8-4-0 Special Fertilizer	8.00		3.29	4.00		21.82
411	American Agricultural Chemical Co., Henderson, N. C.	Ammoniated Fertilizer	8.20	1.40	1.52	2.92	3.55	20.46
443	American Fertilizer Co., Norfolk, Va.	American 8-4 Ammoniated Compound	8.01	2.32	.96	3.28	3.99	21.79
469	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Ammoniated Bone Phosphate	8.94	2.18	.64	2.82	3.43	20.78
410	Contentnea Guano Co., Wilson, N. C.	Climax Special	7.83	2.94	.54	3.48	4.23	22.45
2811	Norfolk Fertilizer Co., Norfolk, Va.	Oriana Fertilizer, 4-8	6.91	1.90	1.40	3.30	4.01	20.77
314	Peruvian Guano Corporation, Charleston, S. C.	Peruvian Sea Island Ammonia Superphosphate.	7.41	2.48	.82	3.30	4.01	21.27
511	Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.	Meal and Fish Mixture No. 2	6.96	2.52	.40	2.92	3.55	19.22
509	Union Guano Co., Winston, N. C.	Special 8-1-0 Superphosphate	8.24	1.52	1.42	2.94	3.57	20.59
394	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s 8-4 Ammonia Compound	8.95	2.30	.70	3.00	3.55	21.55
Brand claiming			9.36	2.56	.14	2.70	3.28	20.70
283	Pamlico Chemical Co., Washington, N. C.	Pamlico Tip Top Potato Guano	8.00		4.11	5.00		25.26
352	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Apollo Special Trucker	7.80	2.42	1.62	4.04	4.91	24.77
212	Upton, L. J. & Co., Norfolk, Va.	Upton's Special Fertilizer, Revised, 1917	8.13	2.88	1.26	4.14	5.03	25.52
213	do.	do.	7.59	2.80	1.28	4.08	4.96	24.73
			7.47	2.76	1.36	4.12	5.01	24.77

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		Potash
Brands claiming									
508	Bryant Fertilizer Co., Wilmington, N. C.	Bryant's Standard Superphosphate	Monroe	9.00	1.60	.60	2.47	3.00	\$ 9.37
440	Coe-Mortimer Co., Charleston, S. C.	Mortimer's Meal Mixture	Clarkton	9.48	.48	1.96	2.20	2.67	18.72
417	Ober, G., & Sons Co., Baltimore, Md.	Ober's Fish Bone Mixture	Durham	9.58	1.78	.88	2.44	2.97	19.83
401	Read Phosphate Co., Charleston, S. C.	Read's Bone and Blood Mixture	Wadesboro	7.87	1.66	.64	2.30	2.80	20.19
473	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's Fertilizer for All Crops, 9-3 Ammoniated Phosphate.	Littleton	8.98	1.62	.82	2.44	2.97	17.53
	Va.-Car. Chemical Co., Richmond, Va.	V.-C. Morgan Ammoniated Compound	Eure	8.05	2.36	.48	2.84	3.45	19.98
275		American 10-2 Ammoniated Compound	Wake Forest	10.00	1.02	.62	1.60	2.00	16.93
377	American Fertilizer Co., Norfolk, Va.	Berkley 2-10-0 Fertilizer	Monroe	10.32	1.20	.52	1.64	1.99	17.21
507	Berkley Chemical Co., Norfolk, Va.	Ammoniated Superphosphate	do.	10.68	1.04	.50	1.54	1.87	17.90
505	Navassa Guano Co., Wilmington, N. C.	Union Special 10-2-0 Ammonia Superphosphate.	Shelby	10.87	1.26	.30	1.56	1.89	17.34
396	Union Guano Co., Winston, N. C.			9.97	1.26	.30	1.56	1.89	16.52
Brand claiming									
2871	Tennessee Chemical Co., Greensboro, N. C.	Ox Ammoniated Superphosphate	Kernersville	10.00			2.47	3.00	20.37
				10.27	.86	1.26	2.12	2.58	19.17
Brands claiming									
494	Coweta Fertilizer Co., Newnan, Ga.	Coweta 10-4 Ammoniated Compound	Henderson	10.00	2.80	.54	3.29	4.00	23.82
437	Pamlico Chemical Co., Washington, N. C.	Pamlico Cotton Producer	Plymouth	10.05	2.36	1.04	3.34	1.06	24.08
404	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Special Mixture	Wadesboro	10.37	2.36	1.04	3.40	4.13	24.65
				10.11	1.96	1.10	3.06	3.72	22.96
510	Robertson Fertilizer Co., Norfolk, Va.	Robertson's 4-10 Guano	Enfield	10.44	1.74	1.24	2.98	3.62	22.96
Brand claiming									
	Cotton States Fertilizer Works, Chester, S. C.	Cotton States 12-2-0 Ammoniated Phosphate.	Newton	12.00	.60	.62	1.65	2.00	18.93
465				13.41			1.22	1.48	18.53

476	Brand claiming Va.-Car. Chemical Co., Richmond, Va.	Southern Chemical Co.'s Mammoth Corn Grower.	Statesville	10.00	2.00	20.00
				10.09	1.66	18.39

RAW OR UNMIXED FERTILIZERS.

Brands claiming				16.00		14.40
478	American Agricultural Chemical Co., New York, N. Y.	16 Per Cent Acid Phosphate	Franklinton	16.57		14.91
2861	Columbia Guano Co., Norfolk, Va.	Columbia H. G. Acid Phosphate	Toecane	17.16		15.44
464	Cotton States Fertilizer Works, Chester, S. C.	Cotton States Acid Phosphate	Newton	17.20		15.48
462	International Agricultural Corporation, Spartanburg, S. C.	High Grade 16 Per Cent Acid Phosphate	Kings Mountain	16.77		15.09
506	Navassa Guano Co., Wilmington, N. C.	Navassa 16 Per Cent Acid Phosphate	Concord	17.51		15.76
403	Peruvian Guano Co., Charleston, S. C.	Peruvian High Grade Acid Phosphate	Marshville	16.74		15.07
418	Pocahontas Guano Co., Lynchburg, Va.	Carrington's S. C. Phosphate, Waukesha Brand	Brown Summit	16.68		15.01
402	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Superb Acid Phosphate	Cherryville	16.79		15.11
370	Rasin-Monumental Co., Baltimore, Md.	Rasin Celebrated Universal Fertilizer	Franklinton	16.00		14.40
2802	Royster, F. S., Guano Co., Norfolk, Va.	Royster's H. G. Acid Phosphate	Toecane	17.04		15.34
397	Swift & Co. Fertilizer Works, Chester, S. C.	Swift's Special High Grade Acid Phosphate	Charlotte	17.51		15.76
399	Swift & Co. Fertilizer Works, Wilmington, N. C.	do.	Cliffside	15.57		14.01
457	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid Phosphate	Hickory	16.14		14.53

Fertilizer Analyses, August 1, 1917.

B. W. KILGORE,
State Chemist.

THE BULLETIN
OF THE
NORTH CAROLINA
DEPARTMENT OF AGRICULTURE
RALEIGH

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Whole No. 236

REPORT OF SEED TESTS FOR 1917

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1917

LETTER OF TRANSMITTAL

RALEIGH, N. C., August 9, 1917.

HON. W. A. GRAHAM,
Commissioner of Agriculture.

SIR:—I have the honor to hand you herewith report of the work done in the North Carolina Seed Laboratory during the past year, and beg to recommend it for publication as the September Bulletin of the Department of Agriculture.

Respectfully submitted,
JAMES L. BURGESS,
In Charge Seed Laboratory.

Approved for Publication:

W. A. GRAHAM,
Commissioner of Agriculture.

GENERAL REMARKS

The following tables show in detail the work done by the North Carolina Seed Laboratory beginning July 15, 1916, and ending July 15, 1917. It will be noted that there were 1,015 samples of agricultural seeds sent in by the farmers and the regularly appointed seed inspectors. There were 667 samples of vegetable seeds received and tested. There were also 123,824 cubic centimeters of tobacco seed recleaned for the tobacco farmers of the State.

Table No. 4 shows the results of tests of 29 kinds of agricultural seeds, 686 samples in all, collected by the inspectors from July 15, 1916, to July 15, 1917.

Table No. 5 shows the summary of the results of tests of 35 kinds of agricultural seeds, 1,015 samples in all, submitted by inspectors and individuals during the year.

Table No. 6 will show how the germination of the various kinds of vegetable seeds ran the past season. There were 24 kinds of vegetable seeds germinated, 667 samples in all.

During the year there were nine cases of adulteration found in the 686 samples of agricultural seeds collected by inspectors. No case is reported where the adulterant was not present to the amount of five per cent.

The last Legislature enacted a new seed law for North Carolina in which great stress is laid on the necessity for the farmer to demand only good, clean, pure seed for seeding purposes. Copies of this law may be secured on application to the Commissioner of Agriculture.

TABLE No. 1.

AGRICULTURAL SEEDS SENT TO THE SEED LABORATORY BY THE INSPECTORS AND FARMERS.

Name	Inspectors' Samples	Samples from Individuals
Alfalfa.....	11	23
Barley.....	1	0
Beans, Soja.....	0	6
Beans, Velvet.....	1	0
Blue Grass, Kentucky.....	42	3
Buckwheat, Japanese.....	1	0
Clover, Alsike.....	8	5
Clover, Burr.....	2	2
Clover, Crimson.....	36	52
Clover, Red.....	109	35
Clover, Sweet.....	4	8
Clover, White.....	2	4
Corn, Field.....	42	56
Cotton.....	0	1
Cowpeas.....	0	26
Fescue, Meadow.....	4	1
Fescue, Sheep.....	0	1
Grass, Crested Dog's-tail.....	0	1
Grass, Italian Rye.....	5	1
Grass, Orchard.....	53	4
Grass, Sudan.....	4	0
Grass, Tall Oat.....	10	2
Millet, German.....	17	0
Millet, Pearl.....	6	0
Oats.....	150	36
Paspalum.....	0	1
Peas, Canada Field.....	1	0
Peanuts.....	0	1
Rape.....	52	3
Redtop.....	31	12
Rye.....	30	27
Timothy.....	47	11
Vetch, Hairy.....	12	5
Vetch, Spring.....	3	0
Wheat.....	2	2
Totals.....	686	329
Total of all agricultural seeds.....		1,015

TABLE II.
TOTAL NUMBER OF SAMPLES OF VEGETABLE SEEDS RECEIVED.

Wholesale Dealer	1916	1917
American Seed Co., Detroit, Mich.....	26	21
American Seedtape Co., New York, N. Y.....	0	4
W. W. Barnard Co., Chicago, Ill.....	3	12
J. Bolgiano & Son, Baltimore, Md.....	0	1
F. W. Bolgiano & Co., Washington, D.C.....	0	1
Robert Buist Co., Philadelphia, Pa.....	40	44
William D. Burt, Dalton, N. Y.....	0	4
Everett B. Clark Seed Co., Milford, Conn.....	3	8
Crosman Bros. Co., Rochester, N. Y.....	27	84
Diggs & Beadles, Richmond, Va.....	7	10
D. M. Ferry & Co., Detroit, Mich.....	23	169
W. G. Grandy, Elizabeth City, N. C.....	0	1
Griffith & Turner, Baltimore, Md.....	3	6
Hall Seed Co., Louisville, Ky.....	0	1
Kirby Seed Co., Gaffney, S. C.....	0	1
Lake Shore Seed Co., Dunkirk, N. Y.....	23	14
D. Landreth Seed Co., Bristol, Pa.....	30	55
Leonard Seed Co., Chicago, Ill.....	31	29
Jerome B. Riee Seed Co., Cambridge, N. Y.....	36	42
Scott Seed Co., Greensboro, N. C.....	0	5
Slate Seed Co., South Boston, Va.....	13	14
George Tait & Sons, Inc., Norfolk, Va.....	0	6
H. Van Buskirk, Rocky Ford, Col.....	0	1
Williams Seed Co., Norfolk, Va.....	0	2
Wood, Stubbs & Co., Louisville, Ky.....	30	48
T. W. Wood & Sons, Richmond, Va.....	46	79
Dealer not given.....	23	5
Totals.....	364	667

TABLE III.

TOBACCO SEED CLEANED FOR THE FARMERS OF THE STATE.

Laboratory Number	Name and Address of Sender	Amount of Recleaned Seed Returned—Cubic Centimeters
6018	J. W. Albertson, Kenansville, N. C.	160
5590	John Aldridge, Haw River, N. C.	260
6001	Roy Alley, Sandy Ridge, N. C.	220
5526	J. A. Anderson, Oxford, N. C.	220
6031	J. H. Arnold, R. 3, Neuse, N. C.	60
5591	T. H. Aycock, Elberon, N. C.	260
5563	R. A. Bailey, Robersonville, N. C.	665
6015	H. L. Baird, R. 2, Willow Springs, N. C.	65
5573	J. W. Barnes, R. 3, Kenly, N. C.	150
6006	G. M. Beavers, R. 1, Apex, N. C.	100
5528	T. B. Bennett, R. 3, Stantonsburg, N. C.	420
5514	W. R. Blalock, Roxboro, N. C.	220
6020	B. F. Blanchard, R. 3, Burlington, N. C.	130
5537	R. C. Broadwell, Apex, N. C.	130
5523	J. H. Brown, Sandy Ridge, N. C.	160
5550	W. L. Brown, Sandy Ridge, N. C.	101
5515	J. O. Burge, Pinnacle, N. C.	90
5597	G. M. Carter, R. 3, Zebulon, N. C.	50
6028	O. B. Cash, Wendell, N. C.	160
6029	J. D. Cash, R. 1, Wendell, N. C.	170
6039	W. F. Castlebury, Apex, N. C.	95
5559	J. G. Castlebury, R. 1, Morrisville, N. C.	25
5560	J. G. Castlebury, R. 1, Morrisville, N. C.	265
5561	J. G. Castlebury, R. 1, Morrisville, N. C.	85
5556	J. Q. Chandler, Fitch, N. C.	55
5567	J. W. Chandler, Ruffin, N. C.	270
5536	E. D. Chilton, Pilot Mountain, N. C.	40
5587	R. M. Clark, Reidsville, N. C.	50
5577	J. E. Clark, Jr., Washington, N. C.	85
5578	J. E. Clark, Jr., Washington, N. C.	525
6005	G. A. Clayton, R. 1, Wakefield, N. C.	40
6038	G. A. Clayton, R. 1, Wakefield, N. C.	50
5502	G. C. Colclough, R. 7, Raleigh, N. C.	130
6012	F. L. Coley, R. 3, Stantonsburg, N. C.	250
5525	Scott H. Cox, Mount Airy, N. C.	40
5547	S. H. Crocker, Stantonsburg, N. C.	285
6027	A. P. Daniel, Hurdle Mills, N. C.	75
6007	J. A. Davis, Warsaw, N. C.	110
5557	J. M. Davis, Boonville, N. C.	130
5546	James Ease, R. 3, Pilot Mountain, N. C.	35
5500	J. E. Ferguson, R. 7, Raleigh, N. C.	125
6009	E. T. Ferrell, Raleigh, N. C.	100
5594	J. W. Finch, R. 3, Henderson, N. C.	296
5569	E. L. Fleming, Middleburg, N. C.	210
5570	E. L. Fleming, Middleburg, N. C.	190
5596	W. W. Garrett, R. 1, Durham, N. C.	275
5535	W. I. Green, R. 2, Zebulon, N. C.	170
6034	S. S. Hall, R. 1, Wendell, N. C.	260
5586	J. W. Hampton, Clemmons, N. C.	55
5585	G. E. Harris, Roxboro, N. C.	21,435
5516	W. T. Hawkins, Hurdle Mills, N. C.	260
5527	J. I. Hawkins, Hurdle Mills, N. C.	50
5530	W. C. Hawkins, Hurdle Mills, N. C.	95
5531	O. C. Hawkins, Hurdle Mills, N. C.	80

TABLE III—CONTINUED.

Laboratory Number	Name and Address of Sender	Amount of Recleaned Seed Returned—Cubic Centimeters
5534	D. S. Hawkins, Hurdle Mills, N. C.	120
5575	H. T. Highfell, Mayodan, N. C.	150
6011	O. R. Hinton, Pelham, N. C.	545
5551	T. A. Hobson, R. 3, Yadkinville, N. C.	60
5552	J. H. Hobson, Yadkinville, N. C.	165
5568	Johnny E. Holloway, Henderson, N. C.	290
5579	D. R. Hopkins, Brown Summit, N. C.	80
5520	J. R. Inman, Westfield, N. C.	60
5545	W. L. Inman, Westfield, N. C.	55
5538	L. L. Jacob, Marshall, N. C.	200
5539	L. L. Jacob, Marshall, N. C.	90
5548	J. L. Jackson, Mount Airy, N. C.	100
6040	J. L. Jackson, Wake Forest, N. C.	260
5574	W. C. Jackson, Wake Forest, N. C.	120
5589	Gattis James, R. 5, Burlington, N. C.	80
5512	S. D. Jenkins, Robersonville, N. C.	230
6000	S. D. Jenkins, Robersonville, N. C.	70
5522	C. D. Jenkins, Robersonville, N. C.	270
5525	Joel Johnson, R. 3, Chapel Hill, N. C.	85
5542	F. D. Jones, R. 1, Kernersville, N. C.	40
5595	John R. Jones, R. 1, Moriah, N. C.	70
6042	Alex. Jones, Zebulon, N. C.	240
6023	W. C. Key, R. 4, Mount Airy, N. C.	30
5581	C. L. Lasater, R. 4, Apex, N. C.	505
6003	Riley Lawson, R. 4, Mount Airy, N. C.	115
5524	R. C. Long, Hurdle Mills, N. C.	180
6027	W. J. Loyd, Wendell, N. C.	120
6022	W. A. Maddry, Hurdle Mills, N. C.	150
5517	T. S. Malloy, Reidsville, N. C.	245
5521	T. S. Malloy, Reidsville, N. C.	420
6025	A. C. Martin, R. 2, Wendell, N. C.	69
5518	Andrew Martin, R. 1, Brim, N. C.	190
5519	T. M. Martin, Sandy Ridge, N. C.	190
5572	J. H. Massey, R. 1, Wakefield, N. C.	50
5510	J. E. Matthews, Pilot Mountain, N. C.	40
5511	J. C. Matthews, Pilot Mountain, N. C.	30
5584	C. W. Maxwell, Brown Summit, N. C.	30
5503	W. H. Maynard, R. 6, Durham, N. C.	80
5582	P. M. Mills, R. 4, Apex, N. C.	280
5532	Monroe Mitchell, Hurdle Mills, N. C.	100
6032	Ira Moore, Stokes, N. C.	1, 130
5549	S. E. Murray, Zebulon, N. C.	40
6004	S. E. Murray, Zebulon, N. C.	60
5566	J. E. McCargo, Reidsville, N. C.	120
5504	J. G. Oakley, R. 7, Raleigh, N. C.	65
5505	J. G. Oakley, R. 7, Raleigh, N. C.	75
6035	Henry Pearce, Wendell, N. C.	120
5565	Alfred Plummer, Middleburg, N. C.	130
6010	M. G. Pulley, Wake Forest, N. C.	45
5533	Charlie Rick's, R. 3, Kenly, N. C.	240
5588	W. E. Royal, Yadkinville, N. C.	240
5541	R. H. Russell, R. 5, Roxboro, N. C.	80
5513	C. G. Satterwhite, R. 5, Oxford, N. C.	120
6041	S. F. Shelton, R. 3, Brim, N. C.	65
6041	S. F. Shelton, R. 3, Brim, N. C.	65

TABLE III—CONTINUED.

Laboratory Number	Name and Address of Sender	Amount of Reeleaned Seed Returned— Cubic Centimeters
5562	Skinner & Patton, Smithfield, N. C.....	1,260
5576	Skinner & Patton, Smithfield, N. C.....	4,420
5596	Thomas H. Smathers, Reidsville, N. C.....	215
5571	H. H. Smith, R. 1, Garner, N. C.....	480
5554	J. W. Smithwick, Manson, N. C.....	200
6026	A. S. Speer, Boonville, N. C.....	65
6013	A. S. Speer, Boonville, N. C.....	90
5599	J. P. Sugg, Tarboro, N. C.....	50
5553	H. M. Talley, Cardenas, N. C.....	525
6014	W. O. Tanner, Norlina, N. C.....	150
5544	G. I. Taylor, Bethel, N. C.....	200
5507	H. E. Taylor, R. 2, Mount Airy, N. C.....	40
5543	T. Jones Taylor, Bethel, N. C.....	250
6024	O. K. Taylor, Whitakers, N. C.....	105
5501	Revis Tilley, Bahama, N. C.....	13,780
5508	P. W. Tilley, Bahama, N. C.....	58,523
6036	H. Underhill, Wendell, N. C.....	35
5592	Robert Walters, Cardenas, N. C.....	50
5593	Robert Walters, Cardenas, N. C.....	80
6019	W. C. Warren, Burlington, N. C.....	100
6033	Alex. Warren, Haw River, N. C.....	80
5540	J. C. Washington, Stem, N. C.....	680
6008	W. A. Watkins, Altamahaw, N. C.....	50
6043	A. W. Watkins, Wake Forest, N. C.....	490
6002	H. H. Weathers, R. 2, Wendell, N. C.....	665
5598	William J. Whitfield, R. 3, Hurdle Mills, N. C.....	180
5564	T. F. Wiggins, Middleburg, N. C.....	555
5558	S. T. Wilder, Louisburg, N. C.....	190
6016	M. C. Wilder, R. 2, Louisburg, N. C.....	200
6017	J. B. Wilder, Louisburg, N. C.....	200
5555	E. H. Wilson, Willow Springs, N. C.....	325
5580	A. J. Wilson, Apex, N. C.....	85
5583	W. J. Wilson, Apex, N. C.....	80
6030	C. L. Wrenn, Garner, N. C.....	610
6021	S. L. Ziglar, Sandy Ridge, N. C.....	100
	Total.....	123,824

TABLE IV.—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
8513	ALFALFA	Albert Dickinson & Co., Chicago, Ill.	L. R. Stricker, Asheville, N. C.	99.86	.14	---	91.5
8023	do	Kirby Seed Co., Gaffney, S. C.	H. B. Hood & Co., Matthews, N. C.	94.94	4.72	---	453.0
8015	do	Loewith, Larson Co., New York, N. Y.	Durham Seed House, Durham, N. C.	99.39	.47	.14	93.0
7992	do (wild carrot)	W. H. Mixon Seed Co., Charleston, S. C.	J. H. Parker & Co., New Bern, N. C.	95.91	.96	3.13	140.5
8276	do	National Seed Co., Louisville, Ky.	Riggan Feed & Seed Co., Winston-Salem, N. C.	98.53	.53	.94	90.5
8369	do	Wm. G. Scarlett & Co., Baltimore, Md.	C. C. Adams, Salisbury, N. C.	99.78	.22	---	93.0
8034	do	do	J. H. Rudisill & Co., Lincolnton, N. C.	99.63	.37	---	83.0
8495	do	T. W. Wood & Sons, Richmond, Va.	W. M. Neel & Co., Mooresville, N. C.	99.64	.36	---	93.0
8032	do	do	J. E. Sloop, Statesville, N. C.	99.67	.33	---	89.0
8016	do	do	J. T. Turner, Asheboro, N. C.	98.88	1.12	---	85.5
8134	do	do	do	99.54	.40	.06	87.0
8058	BARLEY	do	Laneberger Seed Co., Gastonia, N. C.	98.94	.33	.73	455.0
8475	BEANS, SOIA	C. H. Robinson, Elizabeth City, N. C.	Hickory Seed Co., Hickory, N. C.	---	---	---	90.5
8512	BEANS, VELVET	T. W. Wood & Sons, Richmond, Va.	Harris-McCauley Co., Norwood, N. C.	---	---	---	97.0
7923	BLUE GRASS, KENTUCKY	S. T. Beveridge & Co., Richmond, Va.	J. H. Ditmore, Bryson City, N. C.	82.20	17.20	.60	78.0
8544	do	do	do	84.03	15.78	.19	137.0
8300	do	Diggs & Beadles, Richmond, Va.	Crutchenfield Hdw. Co., Thomasville, N. C.	75.05	24.76	.19	17.5
8442	do	do	J. P. Wyatt & Sons Co., Raleigh, N. C.	84.14	15.40	.46	52.0
8366	do	Farmers Supply Co., Roanoke, Va.	C. C. Adams, Salisbury, N. C.	80.52	18.94	.54	135.5
8520	do	Hackney, Broyles & Lackey, Knoxville, Tenn.	---	---	---	---	---
8550	do	Hardin, Hamilton & Lewman, Louisville, Ky.	E. R. Tweed, Marshall, N. C.	87.26	11.23	1.51	66.0
7921	do	D. Landreth Seed Co., Bristol, Tenn.	John E. Fain, Murphy, N. C.	80.42	19.11	.47	410.5
8367	do	Louisville Seed Co., Louisville, Ky.	Grant's Pharmacy, Asheville, N. C.	79.63	20.01	.36	424.5
8545	do	do	J. E. Sloop, Statesville, N. C.	70.76	28.79	.45	112.0
8473	do	National Seed Co., Louisville, Ky.	Waynesville Hdw. Co., Waynesville, N. C.	82.86	16.77	.37	52.0
8166	do	do	City Feed Co., Hickory, N. C.	80.55	18.77	.68	43.0
			W. E. Merritt Co., Mc. Airy, N. C.	75.89	12.49	11.62	49.5

TABLE IV.—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
8062	BLUE GRASS, KENTUCKY	National Seed Co., Louisville, Ky.	Riggan Feed & Seed Co., Winston-Salem, N. C.	83.38	15.82	.80	†17.0
8279	do	do	do	*78.70	20.32	.98	†19.5
8546	do	do	Slayden, Fakes & Co., Asheville, N. C.	*68.14	30.87	.99	48.5
8441	do	Jerome B. Rice, Cambridge, N. Y.	S. J. Adams, Raleigh, N. C.	*77.74	21.61	.65	†41.5
8298	do	Rosnoke Seed & Supply Co., Rosnoke, Va.	Conrad Hdw. Co., Lexington, N. C.	80.90	18.43	.67	†17.0
8299	do	do	S. L. Owen, Lexington, N. C.	82.09	17.33	.58	†7.5
8392	do	Ross Seed Co., Louisville, Ky.	Davis & Wolfe, Charlotte, N. C.	*73.66	25.97	.37	†8.5
8297	do	N. R. Savage & Son, Richmond, Va.	W. D. Lockwell, Greensboro, N. C.	80.07	19.74	.19	†37.0
8364	do	do	S. J. Stallings, Littleton, N. C.	*75.36	24.44	.20	45.0
8393	do	Wm. G. Scarlett & Co., Baltimore, Md.	Gline & Moose, Concord, N. C.	*75.92	22.81	1.27	†7.5
8419	do	do	Durham Seed House, Durham, N. C.	*76.86	22.86	.28	57.0
8063	do	do	Hickory Seed Co., Hickory, N. C.	*56.56	42.91	.53	†25.0
8410	do	Slate Seed Co., South Boston, Va.	Fox & Lyon, Wadesboro, N. C.	*75.41	23.94	.62	†42.5
8554	do	Slayden, Fakes & Co., Asheville, N. C.	D. K. Collins, Bryson City, N. C.	*69.86	29.12	1.02	†44.5
8543	do	do	J. R. Morgan, Clyde, N. C.	86.11	13.60	.29	†42.0
8547	do	L. R. Stricker, Asheville, N. C.	Sylva Supply Co., Sylva, N. C.	81.00	18.13	.57	†34.0
8549	do	T. W. Wood & Sons, Richmond, Va.	Colum & Wiggins, Robbinsville, N. C.	81.22	18.22	.56	†31.5
8411	do	do	English Drug Co., Monroe, N. C.	81.30	18.51	.19	†30.5
8278	do	do	Farmers Cash Feed & Seed Store, Winston-Salem, N. C.	81.04	18.77	.19	52.5
8371	do	do	J. G. Hall, Oxford, N. C.	82.83	17.07	.10	†15.0
8553	do	do	Hunter's Pharmacy, Hendersonville, N. C.	82.16	17.74	.10	†35.0
8064	do	do	Linsberger Seed Co., Gastonia, N. C.	*76.11	23.33	.56	51.5
8492	do	do	do	84.09	14.97	.94	45.0
8548	do	T. W. Wood & Sons, Richmond, Va.	W. H. McClure, Hazelwood, N. C.	83.07	16.74	.19	†33.5
8555	do	do	J. T. Moore, Franklin, N. C.	85.34	14.37	.29	†41.5
8365	do	do	M. C. Ruffy, Salemburg, N. C.	86.11	13.31	.58	†35.0
8482	do	Wood, Stubbs & Co., Louisville, Ky.	Paul Webb, Shelby, N. C.	*48.52	18.15	33.33	53.5

8552	do	Dealer not given	T. S. Morrison & Co., Asheville, N. C.	83.69	16.21	.10	†21.5
7922	do	do	L. R. Stricker, Asheville, N. C.	*71.17	28.10	.73	†2.5
8551	do	do	do	83.56	15.79	.65	†17.5
8563	BUCKWHEAT, JAPANESE	do	do	*92.24	4.61	3.12	†89.0
8171	CLOVER, ALASKA	National Seed Co., Louisville, Ky.	W. E. Merritt Co., Mount Airy, N. C.	96.38	.29	3.33	†89.0
8019	do	T. W. Wood & Sons, Richmond, Va.	Carolina Warehouse Co., Greensboro, N. C.	98.45	.90	.65	†69.5
8061	do	do	H. E. Kendall, Shelby, N. C.	98.69	.63	.68	†73.8
8020	do	do	J. T. Turner, Asheboro, N. C.	98.29	.76	.95	75.5
8564	do	Dealer not given	Grant's Pharmacy, Asheville, N. C.	97.49	.44	2.07	85.5
8566	do	do	T. S. Morrison & Co., Asheville, N. C.	97.83	.15	2.02	89.5
7915	do	do	L. R. Stricker, Asheville, N. C.	98.28	.19	1.53	†72.8
8565	do	do	do	95.85	.38	3.77	92.0
7979	CLOVER, BURR	Diggs & Beadles, Richmond, Va.	E. P. Parker & Co., Washington, N. C.	95.33	4.31	.36	82.0
8051	do	T. W. Wood & Sons, Richmond, Va.	H. E. Kendall, Shelby, N. C.	89.97	9.60	.43	84.0
7936	CLOVER, CUMSON (wild mustard)	S. T. Beveridge & Co., Richmond, Va.	W. M. Sanders, Smithfield, N. C.	*90.36	2.31	7.33	92.5
7937	do	J. J. Buffington & Co., Baltimore, Md.	T. P. Nash, Elizabeth City, N. C.	99.16	.66	.18	†80.5
7937	do	Carter, Venable & Co., Richmond, Va.	J. D. Winstead, Nashville, N. C.	98.60	.67	.73	92.0
7938	do	do	do	*95.36	1.82	2.82	91.0
7984	do	Diggs & Beadles, Richmond, Va.	Bird & Briant, Durham, N. C.	98.75	.66	.59	85.5
8057	do	Kirby & Co., Gaffney, S. C.	H. N. Hood & Co., Matthews, N. C.	98.54	1.07	.39	†83.5
7941	do	W. H. Mixon, Charleston, S. C.	J. H. Parker & Co., Newbern, N. C.	*96.92	2.46	.62	*81.0
7904	do	T. S. Morrison & Co., Asheville, N. C.	Brevard Hardware Co., Brevard, N. C.	93.03	4.74	2.23	87.0
7988	do	Roper & Co., Petersburg, Va.	J. G. Hall, Oxford, N. C.	*97.02	1.37	1.61	86.0
7989	do	N. R. Savage & Sons, Richmond, Va.	J. D. Brooks, Oxford, N. C.	98.17	1.32	.51	95.0
7925	do	do	Edwards & Co., Scotland Neck, N. C.	*95.61	2.47	1.92	†74.5
8382	do	do	M. Hoffman & Bro., Scotland Neck, N. C.	97.97	1.15	.88	88.5
7985	do	do	Hugh Woods, Roxboro, N. C.	*96.20	2.78	1.02	95.0
7991	do	Wm. G. Searlett & Co., Baltimore, Md.	J. G. Hall, Oxford, N. C.	*97.04	2.32	.64	95.5
7940	do	do	A. S. Huske, Fayetteville, N. C.	97.78	1.51	.71	85.0
7944	do	Slate Seed Co., South Boston, Va.	Wilkins, Ricks & Co., Sanford, N. C.	*96.71	2.14	1.15	†65.5
8054	do	L. R. Stricker, Asheville, N. C.	Hickory Seed Co., Hickory, N. C.	98.71	1.07	.22	92.0
8102	do	T. W. Wood & Sons, Richmond, Va.	Beeson Hdw. Co., High Point, N. C.	98.46	1.07	.47	94.5
8184	do	do	J. D. Bland, Marion, N. C.	98.15	1.28	.57	87.0
7986	do	do	Carolina Warehouse Co., Greensboro, N. C.	98.83	.94	.23	89.5
7987	do	do	M. Dorsey Drug Co., Greensboro, N. C.	97.61	.72	1.67	†53.0
8103	do	(wild mustard)	Elder Hdw. Co., Siler City, N. C.	*95.92	1.76	2.32	†83.5
7905	do	do	Grant's Pharmacy, Asheville, N. C.	*97.28	1.49	1.23	86.0
7900	do	do	J. G. Hall, Oxford, N. C.	98.35	1.24	.41	92.5
8107	do	(wild mustard)	The Hardware Store, Siler City, N. C.	*97.34	1.81	.85	87.0

TABLE IV.—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
8056	CLOVER, CRIMSON (<i>Can. thisle</i>)	T. W. Wood & Sons, Richmond, Va.	R. N. Hood & Co., Matthews, N. C.	98.04	.96	1.00	†68.0
7939	do	do	Charles L. Johnson, Warsaw, N. C.	98.44	1.05	.51	86.0
7943	do	do	W. D. Kelly, Clinton, N. C.	97.69	1.43	.88	†81.5
8055	do	do	W. A. Leslie, Morganton, N. C.	97.99	1.50	.51	84.5
do	do	do	Lexington Hdw. Co., Lexington, N. C.	98.21	1.11	.68	86.5
8053	do	do	Lowe Bros. & Co., Kannapolis, N. C.	98.27	.99	.74	86.5
8294	do (<i>wild mustard</i>)	do	A. L. McPherson & Co., Liberty, N. C.	98.26	.94	.80	85.5
8101	do	do	W. J. Nicks, Graham, N. C.	97.63	1.71	.66	90.5
8143	do	do	Watson-King Co., Rockingham, N. C.	*96.54	1.12	2.34	†36.5
8424	do	do	H. E. Wilkinson & Co., Mebane, N. C.	97.96	1.25	.79	84.5
8142	do	do	L. R. Stricker, Asheville, N. C.	98.45	1.32	.23	90.5
7906	do	Dealer not given	J. H. Ditmore, Bryson City, N. C.	97.19	1.30	1.51	†76.0
8572	CLOVER, RED (<i>wild carrot</i>)	S. T. Beveridge & Co., Richmond, Va.	W. W. Parker, Henderson, N. C.	97.91	.90	1.19	82.5
8356	do	do	Moore Bros. & Co., Roxboro, N. C.	97.52	.94	1.54	88.0
8449	do	J. Bolgiano & Son, Baltimore, Md.	C. C. Adams, Salisbury, N. C.	98.41	.78	.81	92.5
8398	do	J. J. Buffington & Co., Baltimore, Md.	Besson Hdw. Co., High Point, N. C.	96.81	1.41	1.78	83.0
8106	do	do	T. P. Nash, Elizabeth City, N. C.	98.74	.48	.78	83.0
8105	do	do	J. E. Sloop, Statesville, N. C.	95.66	2.02	2.32	94.5
8355	do (<i>wild mustard</i>)	Farmers Supply Co., Roanoke, Va.	Bly Hdw. Co., Hendersonville, N. C.	96.10	1.92	1.98	95.5
8575	do	Hackney, Broyles & Lackey Co., Knoxville, Tenn.	do	95.79	1.91	2.30	96.0
8589	do	do	Houston & Son, Hendersonville, N. C.	97.21	1.04	1.75	97.0
8576	do	do	E. R. Tweed, Marshall, N. C.	97.52	1.05	1.43	86.0
8569	do	do	do	98.34	.64	1.02	91.0
8588	do (<i>dodder</i>)	do	do				
7910	do (<i>dodder</i>)	Hardin, Hamilton & Lewman, Louisville, Ky.	John E. Fain, Murphy, N. C.	98.90	.39	.71	88.0
8574	do	do	do	99.16	.42	.42	96.0
7996	do (<i>dodder, wild carrot</i>)	Haywood & Boone, Durham, N. C.	Orange Warehouse Co., Hillsboro, N. C.	*94.23	2.45	3.32	84.0

8464	do. (wild carrot, dodder)	Louisville Seed Co., Louisville, Ky.	L. A. Kincaid, Morganton, N. C.	94.81	1.89	3.30	179.0
8470	do. (wild carrot, dodder)	do.	do.	88.50	2.97	8.53	96.5
8582	do.	do.	Sylva Supply Co., Sylva, N. C.	99.01	.41	.55	89.0
8587	do.	do.	do.	96.95	.79	2.26	94.0
8580	do.	do.	Waynesville Hdw. Co., Waynesville, N. C.	99.08	.49	.43	88.5
8591	do.	do.	do.	97.81	.78	1.41	95.5
7908	do.	T. S. Morrison & Co., Asheville, N. C.	Brevard Hdw. Co., Brevard, N. C.	98.86	.49	.65	177.5
7912	do.	do.	Sylva Supply Co., Sylva, N. C.	99.14	.45	.41	177.5
8155	do.	National Seed Co., Louisville, Ky.	W. E. Merritt Co., Mount Airy, N. C.	98.60	.68	.72	89.0
8581	do.	do.	J. R. Morgan, Clyde N. C.	98.03	.57	1.40	87.0
8586	do.	do.	do.	98.86	.53	.61	175.5
8257	do. (dodder)	do.	Riggan Feed & Seed Store, Winston-Salem, N. C.	96.57	1.22	2.21	83.5
8243	do.	do.	F. L. Smith Hdw. Co., Mount Airy, N. C.	99.01	2.25	6.74	89.5
8245	do.	do.	do.	99.12	.29	.59	83.0
8135	do. (dodder)	J. R. Owen, Randleman, N. C.	Randleman Bargain House, Randleman, N. C.	79.37	5.47	15.16	83.5
8349	do. (dodder)	I. L. Radwaner, New York, N. Y.	J. E. Sloop, Statesville, N. C.	99.37	.22	.41	91.5
8396	do. (wild carrot)	Ross Seed Co., Louisville, Ky.	Davis & Wolfe, Charlotte, N. C.	95.83	1.80	2.37	178.0
8450	do.	do.	W. A. Myatt, Raleigh, N. C.	98.29	.71	1.00	90.5
8350	do. (wild carrot)	I. L. Radwaner, New York, N. Y.	C. C. Adams, Salisbury, N. C.	98.10	.97	.93	88.5
8290	do.	Roanoke Seed & Supply Co., Roanoke, Va.	Conrad Hdw. Co., Lexington, N. C.	97.70	1.17	1.13	87.0
8242	do. (wild carrot)	do.	A. W. Davis, Walnut Cove, N. C.	97.80	.98	1.13	81.0
8240	do. (wild carrot)	do.	D. C. Fulk, Pilot Mountain, N. C.	97.04	1.53	1.43	178.5
8244	do. (wild carrot)	do.	S. W. Fulk Hdw. Co., Pilot Mountain, N. C.	97.78	.83	1.39	88.0
7992	do.	do.	High Point Hdw. Co., High Point, N. C.	99.75	.19	.06	83.5
8292	do.	do.	do.	96.51	1.43	2.06	87.0
8289	do. (wild carrot)	do.	S. L. Owen, Lexington, N. C.	97.71	.98	1.31	91.0
8237	do.	do.	J. W. Redman, Pilot Mountain, N. C.	96.21	1.56	2.23	91.5
8238	do.	do.	W. H. Ried, Pilot Mountain, N. C.	98.62	.77	.61	90.5
8241	do.	do.	do.	97.01	1.19	1.80	93.0
8239	do. (wild carrot)	do.	A. T. Rothrock, Walnut Cove, N. C.	99.13	.34	.53	86.5
8236	do. (wild carrot)	do.	O. N. Swanson, Pilot Mountain, N. C.	97.30	1.28	1.42	82.5
8259	do. (dodder, wild carrot)	N. R. Savage & Son, Richmond, Va.	C. Call, North Wilkesboro, N. C.	97.32	1.69	.99	166.0
8261	do. (wild carrot)	do.	do.	96.78	1.18	2.04	94.0
8246	do. (wild carrot)	do.	Dodson Co., Walnut Cove, N. C.	98.20	.73	1.07	86.5
8260	do. (dodder, wild carrot)	do.	Farmers Cash Feed and Seed Store, Winston-Salem, N. C.	97.20	1.31	1.49	157.0

TABLE IV.—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed of Per Cent of	Inert Matter of Per Cent of	Foreign Seed of Per Cent of	Germination of Per Cent of
8291	Clover, Red.	N. R. Savage & Son, Richmond, Va.	Lexington Hardware Co., Lexington, N. C.	97.43	1.02	1.55	759.5
8038	do (wild carrot, dodder).	do	W. E. Merritt, Mount Airy, N. C.	97.42	1.38	1.20	759.0
8151	do	do	do	99.11	.63	.26	95.5
8153	do	do	do	96.43	1.99	1.58	84.0
8136	do (wild carrot)	do	Mount Airy Feed Store, Mount Airy, N. C.	97.80	1.13	1.07	85.0
8137	do (wild carrot)	do	Scott Seed Co., Greensboro, N. C.	97.54	1.29	1.17	80.0
8357	do (wild carrot)	do	do	98.32	.71	.97	87.0
8154	do (wild carrot)	do	S. J. Stallings, Littleton, N. C.	91.18	.83	.99	88.5
7995	do (wild carrot)	do	W. P. Ware, Reidsville, N. C.	97.91	.95	1.14	765.0
8451	do (wild carrot)	do	Hugh Woods, Roxboro, N. C.	97.94	1.02	1.04	91.0
8463	do	do	do	99.48	.27	.25	91.5
8035	do (wild carrot)	William G. Scarlett & Co., Baltimore, Md.	Boyd Feed Co., Hickory, N. C.	96.77	1.24	1.99	761.0
8039	do (wild carrot)	do	Hickory Seed Co., Hickory, N. C.	98.07	1.11	.82	775.5
7980	do	do	J. H. Rudisill & Co., Lincolnton, N. C.	96.71	1.52	1.77	85.5
8577	do (wild carrot)	Slate Seed Co., South Boston, Va.	A. S. Huske, Fayetteville, N. C.	95.55	1.80	2.65	731.0
8152	do (wild carrot)	Slayden, Fakes & Co., Asheville, N. C.	D. K. Collins, Bryson City, N. C.	98.49	.60	.91	87.0
8156	do	Smith Seed and Feed Co., Danville, Va.	J. H. Burton, Reidsville, N. C.	99.37	.37	.26	89.5
8163	do	do	J. D. McCallum & Sons, Reidsville, N. C.	99.48	.28	.24	84.5
8401	do	do	do	99.30	.34	.36	88.0
8104	do	T. W. Wood & Sons, Richmond, Va.	F. B. Ashcraft, Monroe, N. C.	98.29	.83	.88	94.0
7909	do	do	Beeson Hardware Co., High Point, N. C.	*86.32	2.97	10.71	74.5
7997	do	do	Byers Brothers, Hendersonville, N. C.	98.63	.82	.55	82.5
8471	do (wild carrot)	do	Carolina Warehouse Co., Greensboro, N. C.	98.42	.57	1.01	90.5
8369	do	do	City Feed Co., Hickory, N. C.	99.03	.40	.57	93.5
8571	do	do	Cline & Moose, Concord, N. C.	98.68	.91	.41	97.5
8402	do	do	Coburn & Wiggins, Robbinsville, N. C.	98.99	.20	.81	87.5
8258	do	do	English Drug Co., Monroe, N. C.	98.78	.44	.78	95.0
do	do	do	Farmers Cash Feed and Seed Store, Winston-Salem, N. C.	98.99	.26	.75	81.0
8487	do (wild carrot)	do	Farmers Hardware Co., Forest City, N. C.				

7911	do	do	Grant's Pharmacy, Asheville, N. C.	98.56	.66	79.0
8109	do	do	The Hardware Store, Siler City, N. C.	99.56	.24	89.0
8570	do	do	Hunter's Pharmacy, Hendersonville, N. C.	99.64	.24	74.5
8351	do	do	Iredell Farmers' Union Warehouse Co., Statesville, N. C.	99.19	.55	94.5
8486	do	do	H. E. Kondall, Shelby, N. C.	99.64	.14	92.5
8425	do	(wild carrot)	C. E. King & Sons, Durham, N. C.	99.48	.10	78.5
8353	do	do	W. L. Klutz, Salisbury, N. C.	99.52	.24	94.0
8037	do	do	W. A. Leslie, Morganton, N. C.	98.37	1.04	87.0
8288	do	do	Lexington Hdw. Co., Lexington, N. C.	99.42	.36	93.5
8485	do	do	Lincoln Farmers' Union Warehouse Co., Lincoln, N. C.	99.18	.41	91.5
8036	do	do	Lineberger Seed Co., Gastonia, N. C.	98.70	.78	84.0
8584	do	do	W. H. McClure, Hazelwood, N. C.	99.20	.36	94.5
8590	do	do	do	98.98	.57	94.0
8578	do	do	J. T. Moore, Franklin, N. C.	99.45	.20	92.4
8506	do	do	W. M. Neel & Co., Mooresville, N. C.	99.14	.43	93.0
8352	do	do	M. C. Ruffy, Salisbury, N. C.	99.68	.22	89.5
8354	do	do	Sherrill & Reece, Statesville, N. C.	99.46	.24	90.0
7993	do	do	J. T. Turner, Asheboro, N. C.	98.87	.90	87.5
8397	do	do	White-Morrison-Flowe Co., Concord, N. C.	99.28	.34	85.5
8400	do	do	do	98.68	.50	91.5
8395	do	do	M. L. Widerhouse, Concord, N. C.	99.38	.24	92.5
7994	do	do	Hugh Woods, Roxboro, N. C.	99.28	.44	87.0
8448	do	do	do	98.09	.55	85.5
8452	do	do	do	98.67	.41	89.0
8447	do	do	J. P. Wyatt & Sons Co., Raleigh, N. C.	99.54	.22	92.0
8579	do	Dealer not given	Grant's Pharmacy, Asheville, N. C.	99.39	.18	95.0
8573	do	do	T. S. Morrison & Co., Asheville, N. C.	97.75	.76	85.0
7907	do	do	L. R. Stricker, Asheville, N. C.	98.36	.76	88.0
7913	do	do	do	98.04	1.02	88.5
8583	do	do	do	98.29	.51	84.0
8585	do	do	do	96.54	1.05	81.5
7917	CLOVER, SWEET	Kirby Seed Co., Gaffney, S. C.	99.55	.35	.10	42.5
8014	do	T. W. Wood & Sons, Richmond, Va.	99.55			16.5
7916	do	Dealer not given.				15.5
8559	do	do				82.5
8423	CLOVER, WHITE	J. J. Buffington & Co., Baltimore, Md.	95.98	.24	3.78	83.3
8432	do	Nungesser-Dickinson Co., Hoboken, N. J.	95.11	.44	4.45	
		Durham Seed House, Durham, N. C.				
		J. P. Wyatt & Sons Co., Raleigh, N. C.				

TABLE IV.—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
7914	CLOVER, WHITE	Dealer not given	L. R. Stricker, Asheville, N. C.	97.72	.54	1.74	†58.8
8558	do	do	do	95.76	.73	3.51	†72.8
8539	CORN, FIELD	Robert Buist Co., Philadelphia, Pa.	Justus Pharmacy, Hendersonville, N. C.				100.0
8282	do	do	C. R. Thomas, Thomasville, N. C.				96.5
8304	do	Everett B. Clark Seed Co., Green Bay, Wis.	Garden Drug Store Co., Greensboro, N. C.				†76.0
8090	do	Crosman Bros. Co., Rochester, N. Y.	W. L. McRae, Maxton, N. C.				98.5
8429	do	Diggs & Beadles, Richmond, Va.	F. B. Ashcraft, Monroe, N. C.				97.0
8415	do	do	Durham Seed House, Durham, N. C.				97.0
8089	do	do	Gaston Terry & Co., Hamlet, N. C.				†66.0
8091	do	do	do				94.5
8472	do	D. M. Ferry & Co., Detroit, Mich.	L. A. Kincaid, Morganton, N. C.				†73.0
8468	do	D. Landreth Seed Co., Bristol, Pa.	Freeze Drug Co., Newton, N. C.				†92.0
8301	do	do	J. E. Welch, High Point, N. C.				†90.5
8303	do	do	do				†91.5
8305	do	do	do				†89.5
8167	do	Jerome B. Rice, Cambridge, N. Y.	J. D. Daniels, Goldsboro, N. C.				100.0
8216	do	do	do				92.0
8348	do	do	W. W. Parker, Henderson, N. C.				95.0
8430	do	Slate Seed Co., South Boston, Va.	Covington-Rodgers Drug Co., Durham, N. C.				95.0
8417	do	do	C. E. King & Sons, Durham, N. C.				95.0
8347	do	T. W. Wood & Sons, Richmond, Va.	C. C. Adams, Salisbury, N. C.				92.5
8431	do	do	S. J. Adams, Raleigh, N. C.				94.5
8169	do	do	J. H. Burton, Reidsville, N. C.				98.5
8478	do	do	Farmers Hardware Co., Forest City, N. C.				98.0
8479	do	do	do				†73.0
8508	do	do	Harris-McCaulley Co., Norwood, N. C.				99.5
8509	do	do	Harris-McNeely Co., Mooresville, N. C.				†89.5
8510	do	do	do				96.5
							96.0

8168	do	do	Hawks-Rothrock Drug Co., Mount Airy, N. C.			96.0
8170	do	do	do			91.0
8477	do	do	Lincoln Farmers' Union Warehouse Co., Lincoln, N. C.			96.5
8507	do	do	Linberger Seed Co., Gastonia, N. C.			96.5
8302	do	do	Mann Drug Co., High Point, N. C.			95.0
8390	do	do	F. L. Smith Drug Co., Kannapolis, N. C.			98.5
8391	do	do	do			97.5
8283	do	do	J. B. Smith Co., Lexington, N. C.			96.0
8428	do	do	Watson-King Co., Durham, N. C.			99.0
8387	do	do	White-Morrison-Flowe Co., Concord, N. C.			95.5
8388	do	do	do			93.5
8389	do	do	do			98.0
8306	do	do	Wood, Stubbs & Co., Louisville, Ky.			
8370	do	do	do			98.5
8229	do	do	W. J. Nicks, Graham, N. C.			99.0
8340	do	do	A. T. Rothrock, Walnut Cove, N. C.			98.5
8084	FESCUE, MEADOW	do	L. R. Stricker, Asheville, N. C.			99.0
8338	do	do	A. S. Huske, Fayetteville, N. C.	99.03	.87	160.0
8517	do	do	C. C. Adams, Salisbury, N. C.	97.86	1.20	160.5
8604	do	do	Coeburn & Wiggins, Robbinsville, N. C.	96.57	1.91	124.5
8127	GRASS, ITALIAN RYE	do	L. R. Stricker, Asheville, N. C.	*94.15	4.24	161
8368	do	do	E. P. Carter Co., Washington, N. C.	*91.07	6.46	2.47
8045	do	do	C. C. Adams, Salisbury, N. C.	94.70	4.11	1.19
8511	do	do	W. A. Leslie, Morganton, N. C.	*91.78	5.10	3.12
8567	do	do	W. M. Neel & Co., Mooresville, N. C.	95.86	2.23	1.91
8132	GRASS, ORCHARD	do	L. R. Stricker, Asheville, N. C.	97.00	1.71	.69
8017	do	do	T. P. Nash, Elizabeth City, N. C.	83.03	15.23	1.74
8518	do	do	Hugh Woods, Roxboro, N. C.	*42.56	40.07	17.37
8131	do	do	L. R. Stricker, Asheville, N. C.	73.94	25.73	.33
8523	do	do	E. P. Carter Co., Washington, N. C.	78.07	21.48	.45
	do	do	Tenn.			
8461	do	do	Bly Hardware Co., Hendersonville, N. C.	73.91	23.49	2.60
8362	do	do	L. A. Kincaid, Morganton, N. C.	*52.57	34.11	13.32
8314	do	do	J. E. Sloop, Statesville, N. C.	71.55	25.77	2.68
8515	do	do	Sylva Supply Co., Sylva, N. C.	75.48	22.77	1.75
	do	do	Edwin Fincher, Clyde, N. C.	81.99	17.52	.49
8147	do	do	W. E. Merritt Co., Mount Airy, N. C.	80.76	18.56	.68

TABLE IV.—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917.—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed of Per Cent of	Inert Matter of Per Cent of	Foreign Seed of Per Cent of	Germination of Per Cent of
8268	GRASS, ORCH. (<i>cheat, wild garlic</i>)	T. W. Wood & Sons, Richmond, Va.	Riggan Feed and Seed Co., Winston-Salem, N. C.	75.92	21.08	3.00	80.0
8516	do	do	do	71.83	28.37	.30	78.0
8224	do	do	Slayden, Fakes & Co., Asheville, N. C.	78.71	20.47	.82	†62.0
8150	do	Roanoke Seed and Supply Co., Roanoke, Va.	F. L. Smith Hdw. Co., Mount Airy, N. C.				
8164	do	do	J. H. Burton, Reidsville, N. C.	78.89	18.61	2.50	82.0
8284	do	do	do	87.17	12.25	.58	87.0
8226	do	do	Conrad Hardware Co., Lexington, N. C.	78.78	20.73	.49	†60.0
8286	do	do	S. W. Fulk Hdw. Co., Pilot Mountain, N. C.	77.78	22.33	.39	†50.5
8285	do	do	High Point Hdw. Co., High Point, N. C.	*60.32	19.60	20.08	88.5
8225	do	do	S. L. Owen, Lexington, N. C.	71.60	26.25	2.15	92.5
8225	do	do	A. T. Rothrock, Walnut Cove, N. C.	*68.41	26.04	5.52	†59.0
8386	do	Ross Seed Co., Louisville, Ky.	Davis & Wolfe, Charlotte, N. C.	86.08	12.11	1.81	85.0
8270	do	N. R. Savage & Son, Richmond, Va.	C. Call, North Wilkesboro, N. C.	*58.08	40.98	.94	77.0
8149	do	do	J. D. McCallum & Sons, Reidsville, N. C.	81.81	17.11	1.08	71.0
8043	do	do	W. E. Merritt, Mount Airy, N. C.	83.78	14.77	1.45	90.5
8223	do (<i>cheat</i>)	do	W. H. Reid, Pilot Mountain, N. C.	85.31	11.83	2.86	83.0
8363	do	do	S. J. Stallings, Littleton, N. C.	85.60	13.41	.99	91.5
8148	do	do	W. P. Ware, Reidsville, N. C.	79.46	20.02	.52	73.5
8453	do	do	Hugh Woods, Roxboro, N. C.	71.26	23.54	.20	78.0
8462	do (<i>wild garlic</i>)	William G. Searlett, Baltimore, Md.	Boyd Feed Co., Hickory, N. C.	78.60	18.56	2.84	88.0
8355	do	do	Cline & Moose, Concord, N. C.	*43.79	55.68	.53	85.0
8426	do	do	Durham Seed House, Durham, N. C.	91.14	7.65	1.21	89.0
8045	do (<i>cheat</i>)	do	Hickory Seed Co., Hickory, N. C.	*65.15	33.87	.98	86.0
7981	do	do	Wilkins, Rioks & Co., Sanford, N. C.	*60.55	38.67	.78	83.5
7929	do (<i>wild garlic</i>)	L. R. Stricker, Asheville, N. C.	Hyatt & Co., Waynesville, N. C.	78.77	18.23	3.00	89.0
8133	do	T. W. Wood & Sons, Richmond, Va.	Beeson Hdw. Co., High Point, N. C.	75.57	19.21	5.22	72.5
8460	do (<i>wild garlic</i>)	do	City Feed Co., Hickory, N. C.	78.21	15.57	6.22	86.5
8047	do	do	English Drug Co., Monroec, N. C.	*68.59	28.63	2.78	78.5

8407	do. (wild garlic)	do	Farmers Cash Feed and Seed Store, Winston-Salem, N. C.	70.98	26.22	2.80	68.5
8269	do. (wild garlic)	do	Grant's Pharmacy, Asheville, N. C.	78.00	18.53	3.47	80.0
7930	do	do	Iredell Farmers' Union Warehouse Co., Statesville, N. C.	77.55	20.09	2.36	85.0
8361	do	do	H. E. Kendall, Shelby, N. C.	80.61	16.34	3.05	83.0
8483	do	do	W. A. Leslie, Morganton, N. C.	78.74	17.05	4.21	78.5
8046	do	do	Laneberger Seed Co., Gastonia, N. C.	79.98	19.48	.54	89.0
8505	do. (wild garlic)	do	W. H. McClure, Hazelwood, N. C.	79.18	17.66	3.16	88.5
8522	do	do	J. T. Moore, Franklin, N. C.	72.02	23.10	4.88	88.0
8521	do	do	Morrow Bros. & Heath Co., Albemarle, N. C.	83.44	14.58	1.98	87.0
8504	do	do	W. M. Neel & Co., Mooresville, N. C.	82.98	15.41	1.61	86.5
8503	do	do	Sherrill & Reece, Statesville, N. C.	83.52	13.55	2.93	75.5
8360	do	do	J. T. Turner, Asheboro, N. C.	82.95	15.96	1.09	83.5
8018	do	do	T. S. Morrison & Co., Asheville, N. C.	83.06	16.64	.30	94.0
8514	do	Dealer not given.	J. E. Sloop & Co., Statesville, N. C.	79.47	19.28	1.25	71.5
8044	do. (cheat)	do	L. R. Stricker, Asheville, N. C.	51.85	42.56	5.59	86.5
7981	do	do	Wilkins, Ricks & Co., Sanford, N. C.	29.09	70.86	.05	82.0
7983	GRASS, SUDAN	do	J. T. Moore, Franklin, N. C.	98.66	1.34	-----	66.0
8556	do	do	Paul Webb, Shelby, N. C.	96.72	2.47	.81	75.5
8476	do	do	L. R. Stricker, Asheville, N. C.	96.70	2.27	1.03	79.5
8557	do	Dealer not given.	Bly Hdw. Co., Hendersonville, N. C.	94.54	1.91	3.55	78.5
8562	GRASS, TALL OAT	do	S. L. Owen, Lexington, N. C.	86.86	12.78	.36	43.5
8287	do	Tenn.	Iredell Farmers' Union Warehouse Co., Statesville, N. C.	64.05	33.42	2.53	77.0
8345	do	Va.	Sylva Supply Co., Sylva, N. C.	93.00	6.30	.70	94.5
8561	do	do	City Feed Co., Hickory, N. C.	77.96	20.78	1.26	71.5
8474	do. (cheat)	do	W. A. Leslie, Morganton, N. C.	92.98	4.98	2.04	94.0
8050	do	do	J. T. Moore, Franklin, N. C.	86.38	11.00	2.62	75.5
8560	do	do	Morrow Bros. & Heath Co., Albemarle, N. C.	85.00	12.82	2.18	83.0
8500	do	do	M. C. Ruffy, Salisbury, N. C.	80.54	13.34	46.12	73.0
8049	do	do	L. R. Stricker, Asheville, N. C.	78.43	12.29	9.28	43.0
7928	do	Dealer not given.	Beeson Hdw. Co., High Point, N. C.	85.71	13.31	.98	45.0
8121	MILLET, GERMAN	do	Boyd Feed Co., Hickory, N. C.	98.23	.36	1.41	84.5
8466	do	do	Laudis Grocery Co., Henderson, N. C.	99.54	.34	.12	93.5
8559	do	do		99.24	.55	.21	91.5

TABLE IV.—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917.—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
8440	MILLET, GERMAN	Diggs & Beadles, Richmond, Va.	Hugh Woods, Roxboro, N. C.	98.36	1.58	.06	89.5
8295	do	Roanoke Seed and Supply Co., Roanoke, Va.	High Point Hdw. Co., High Point, N. C.	98.44	.20	1.36	97.0
7978	do	G. A. Saunders, Richmond, Va.	Austin Stephenson, Smithfield, N. C.	98.09	.82	1.09	163.5
8157	do	N. R. Savage & Sons, Richmond, Va.	J. H. Burton, Reidsville, N. C.	99.32	.56	.12	117.0
8358	do	do	W. M. Neel & Co., Mooresville, N. C.	99.14	.04	.82	99.0
8256	do	do	Parham Supply Co., Henderson, N. C.	99.57	.37	.06	85.5
8502	do	do	Dodson Company, Walnut Cove, N. C.	95.87	3.88	.25	19.5
8408	do	do	Laneberger Seed Co., Gastonia, N. C.	98.38	.78	.84	96.5
8481	do	do	English Drug Co., Monroe, N. C.	98.85	.69	.46	167.0
8480	do	do	Farmers Hardware Co., Forest City, N. C.	98.60	.94	.46	96.0
8027	do	do	H. E. Kendall, Shelby, N. C.	99.22	.32	.46	97.5
8144	do	do	W. A. Leslie, Morganton, N. C.	98.11	1.50	.39	176.5
8541	do	do	W. J. Nicks, Graham, N. C.	98.65	1.17	.18	112.5
8199	MILLET, PEARL	Dealer not given	Stricker Seed Co., Asheville, N. C.	99.45	.22	.33	85.0
8198	do	T. W. Wood & Sons, Richmond, Va.	Palace Drug Co., Goldsboro, N. C.	99.29	.71	---	75.5
8197	do	do	B. F. Powell, Clinton, N. C.	*98.25	1.75	---	76.5
8409	do	do	Ruffin-High Co., Wilson, N. C.	99.20	.49	.31	71.5
8072	do	do	Watson-King Co., Rockingham, N. C.	*98.48	1.21	.31	68.0
8542	do	do	Pace Grocery Co., Maxton, N. C.	98.91	1.09	---	73.0
8313	OATS, (cheat)	Adams Grain and Provision Co., Charlotte, N. C.	L. R. Stricker, Asheville, N. C.	99.09	.91	---	87.5
8312	do	do	Bellamy & Co., Enfield, N. C.	97.79	1.45	.76	98.0
8079	do	do	J. R. Bunting & Sons, Bethel, N. C.	*94.99	2.73	2.28	173.5
8327	do	do	Chadbourn Grocery Co., Chadbourne, N. C.	*97.10	2.36	.54	98.0
8375	do	do	W. S. Clark & Son, Tarboro, N. C.	*97.16	2.47	.37	173.5
8185	do	do	Howard Jobbing Co., Weldon, N. C.	98.46	1.45	.09	162.0
8193	do	do	Nash Supply Co., Nashville, N. C.	97.94	1.83	.23	89.5
	do	do	do	*97.26	1.96	.78	98.0

8373	do	do	W. T. Parker Co., Weldon, N. C.	*97.10	2.90	471.0
8374	do	do	J. H. Roberson & Co., Robersonville, N. C.	*96.96	1.39	97.5
8192	do	do	Spring Hope Grocery Co., Spring Hope, N. C.			
8326	do	do	Weldon Grocery Co., Weldon, N. C.	*95.66	.77	485.0
8314	do	do	C. M. Whitehead, Littleton, N. C.	*96.44	2.61	456.0
8325	do	do	do	97.90	1.47	473.0
8021	do	do	do	98.46	1.26	99.5
	do	do	Adams Grain and Provision Co., Richmond, Va.			
7961	do	do	J. D. Brooks, Oxford, N. C.	*86.27	4.99	95.0
7956	do	do	H. C. Joyner, Rocky Mount, N. C.	*96.97	1.30	96.0
8191	do	do	Nash Supply Co., Nashville, N. C.	*97.42	2.58	90.5
8099	do	do	Brinkley, Wood & Griffin, Spring Hope, N. C.	97.78	1.58	98.0
8219	do	do	E. P. Carter Co., Washington, N. C.	98.29	.99	72
8078	do	do	Cockrell Williams, Jr., Nashville, N. C.	99.38	.26	36
8080	do	do	Hamlet Feed Co., Hamlet, N. C.	*97.13	2.51	36
8377	do	do	do	*97.10	2.55	35
8087	do	do	Horner Bros. Co., Oxford, N. C.	98.76	1.24	443.0
8088	do	do	A. B. Hunter & Co., Apex, N. C.	98.62	1.28	10
8322	do	do	do	*96.01	3.68	31
8323	do	do	Lyons-Winston Co., Oxford, N. C.	*97.25	2.54	21
8372	do	do	do	*96.93	2.32	75
8321	do	do	do	98.33	1.39	28
8319	do	do	McGhee-Joyner Co., Franklinton, N. C.	97.93	2.00	47
8376	do	do	R. B. Peters Grocery Co., Tarboro, N. C.	*96.36	3.25	39
8076	do	do	do	98.75	.81	44
8077	do	do	E. W. Rhoades, Hamlet, N. C.	*96.56	3.17	27
8320	do	do	do	*92.77	6.07	116
7955	do	do	N. E. Stedman & Co., Halifax, N. C.	97.92	1.50	58
7954	do	do	T. P. Nash, Elizabeth City, N. C.	99.39	.61	488.5
8315	do	do	A. J. Cox, Washington, N. C.	*94.69	4.88	96.5
8324	do	do	Harrison Bros. Co., Williamston, N. C.	*96.85	3.15	100.0
8012	do	do	Whitehurst-Andrews Co., Bethel, N. C.	*96.81	2.82	37
8422	do	do	Durham Seed House, Durham, N. C.	*97.22	2.48	30
8095	do	do	Covington-Rogers Drug Co., Durham, N. C.	97.56	2.03	41
8026	do	do	A. J. Cox, Washington, N. C.	*96.85	2.04	111
8310	do	do	Landis Grocery Co., Henderson, N. C.	*93.87	1.55	95.5
8318	do	do	do	97.63	2.37	475.0
8311	do	do	do	*96.82	3.18	446.5
	do	do	Parham Supply Co., Henderson, N. C.	98.61	1.39	478.0

TABLE IV. RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917.—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
8140	OATS.....	Diggs & Beadles, Richmond, Va.	Scott Seed Co., Greensboro, N. C.	98.74	1.26	—	95.5
8141	do.....	do.....	do.....	*95.13	.57	4.30	*64.0
8454	do..... (<i>wild mustard</i>)	do.....	Hugh Woods, Roxboro, N. C.	*96.01	3.13	.86	97.5
8455	do.....	do.....	do.....	*96.35	2.96	.69	99.0
8201	do.....	D. H. Dixon, Goldsboro, N. C.	M. J. Best & Sons, Goldsboro, N. C.	*97.19	2.13	.68	91.0
8217	do.....	do.....	H. L. Bizzell, Goldsboro, N. C.	*95.62	3.82	.56	100.0
8184	do.....	do.....	C. A. Dawson & Bro., Kingston, N. C.	98.08	1.92	—	99.0
8180	do.....	do.....	Y. H. Knowles Co., Mount Olive, N. C.	*95.99	4.00	.01	99.0
8186	do.....	do.....	C. A. Summerlin, Mount Olive, N. C.	*96.10	3.80	.10	97.5
8218	do.....	do.....	B. G. Thompson, Goldsboro, N. C.	*96.28	3.72	—	94.5
8009	do..... (<i>cheat, wild garlic</i>)	Durham Seed House, Durham, N. C.	Durham Seed House, Durham, N. C.	98.06	.93	1.01	98.0
8082	do.....	Hall & Pearsall, Wilmington, N. C.	Brown Mercantile Co., Chadbourn, N. C.	*96.66	2.97	.37	*73.0
8100	do.....	do.....	Wallace Grocery Co., Wallace, N. C.	*95.90	4.00	.10	98.5
8182	do..... (<i>wild mustard</i>)	do.....	Jeffrey's Sons, Goldsboro, N. C.	*88.02	3.24	8.74	98.5
8220	do.....	do.....	Mount Olive Grocery and Hardware Co., Mount Olive, N. C.	97.56	2.44	—	93.0
8183	do..... (<i>cheat</i>)	do.....	J. P. Walters, LaGrange, N. C.	*96.10	2.92	.98	95.5
8123	do.....	do.....	J. P. Wilson, Warsaw, N. C.	98.18	1.57	.25	*60.5
7960	do.....	Howe Grain and Mercantile Co., Howe, Tex.	Hardison & Hardison, Wadesboro, N. C.	*96.85	2.32	.83	94.0
8458	do.....	Hughes Grain Co., Howe, Tex.	W. A. Myatt, Raleigh, N. C.	*93.87	6.65	.08	99.5
8071	do.....	Hughes & McCoy, Howe, Tex.	Heath & Morrow Co., Monroe, N. C.	97.81	2.19	—	99.5
7952	do.....	T. H. Jennette, Lake Landung, N. C.	E. P. Carter & Co., Washington, N. C.	98.36	1.64	—	97.0
8412	do.....	Lee D. Jones, Memphis, Tenn.	T. P. Redwine, Monroe, N. C.	*91.99	2.26	5.75	17.0
8187	do..... (<i>cheat</i>)	Mayo Milling Co., Richmond, Va.	Highsmith & Jackson, Clinton, N. C.	*97.31	2.39	.30	*32.5
8194	do.....	do.....	do.....	*95.36	4.45	.19	93.5
8190	do.....	do.....	J. B. Johnston, Greenville, N. C.	98.55	1.44	.01	97.0
8179	do.....	do.....	Jones, Sherwood & Co., Nashville, N. C.	97.99	1.86	.15	99.5
8221	do.....	do.....	King Coöperative Co., Nashville, N. C.	98.42	1.02	.56	96.5
8202	do.....	do.....	M. S. Merritt, Clinton, N. C.	*94.47	2.38	3.15	*45.5

8068	do.	Newport Mill Co., London, Tenn.	Hickory Seed Co., Hickory, N. C.	98.46	1.42	.12	155.0
8083	do.	W. F. Richardson, Jr., Richmond, Va.	John T. Biggs, Lumberton, N. C.	*96.54	2.40	.97	96.0
8081	do.	do.	L. H. Caldwell, Lumberton, N. C.	98.09	1.34	.57	98.5
8414	do. (cheat)	do.	Hardison Company, Wadesboro, N. C.	*97.09	1.49	1.42	98.0
8252	do.	Roanoke Seed and Supply Co., Roanoke, Va.	A. W. Davis, Walnut Cove, N. C.	*96.67	3.33		97.0
8281	do.	do.	High Point Hdw. Co., High Point, N. C.	98.87	1.13		95.5
8023	do. (cheat)	do.	Joyce Jones & Co., Walnut Cove, N. C.	*96.10	3.61	.29	180.5
8024	do. (wild mustard)	do.	do.	*97.01	2.93	.06	180.5
8249	do.	do.	A. T. Rothrock, Walnut Cove, N. C.	98.89	.37	.74	174.0
7957	do. (cheat)	E. A. Saunders, Richmond, Va.	Austin Stephenson, Smithfield, N. C.	*95.70	4.19	.11	94.5
8284	do.	N. R. Savage & Son, Richmond, Va.	C. C. Adams, Salisbury, N. C.	98.35	1.64	.01	98.0
8007	do.	do.	Bird, Briant & Co., Durham, N. C.	*96.34	3.31	.35	98.0
8307	do.	do.	Burroughs, Pittman & Wheeler Co., Scotland Neck, N. C.	*97.39	2.19	.42	178.5
8263	do.	do.	C. Call, North Wilkesboro, N. C.	98.85	1.08	.07	96.0
8267	do.	do.	do.	99.10	.90		159.0
8275	do.	do.	do.	*96.81	3.04	.15	97.0
8251	do.	do.	Dodson Company, Walnut Cove, N. C.	*97.25	2.59	.16	99.5
8253	do.	do.	do.	98.91	1.09		95.0
8069	do.	do.	Farmers Cash Seed and Feed Store, Winston-Salem, N. C.	*97.32	2.45	.23	96.5
8264	do.	do.	do.	*96.08	2.76	1.16	93.5
8265	do.	do.	do.	98.44	1.58		139.0
8266	do.	do.	do.	*96.99	2.85	.16	99.0
8288	do.	do.	J. W. & D. S. Fuller, Oxford, N. C.	*96.89	3.08	.03	99.5
8250	do.	do.	Fulton & Davis, Walnut Cove, N. C.	97.73	2.01	.26	93.0
8146	do.	do.	Gibsonville Hdw. Co., Gibsonville, N. C.	98.86	1.01	.13	96.5
8467	do.	do.	Hickory Seed Co., Hickory, N. C.	*95.48	3.80	.72	93.5
do.	do.	do.	M. Hoffman & Bro., Scotland Neck, N. C.	98.33	1.52	.15	99.5
8330	do.	do.	Horner Bros. Co., Oxford, N. C.	98.11	1.71	.18	95.0
8331	do.	do.	W. L. Klutz, Salisbury, N. C.	*96.38	2.96	.66	98.5
8173	do. (wild mustard)	do.	W. E. Merritt Co., Mount Airy, N. C.	*97.10	2.88	.02	99.0
8172	do.	do.	Mount Airy Feed Store, Mount Airy, N. C.	*97.38	2.53	.09	98.5
8175	do.	do.	do.	98.64	1.36		169.5
8316	do.	do.	Parham Supply Co., Henderson, N. C.	*97.18	2.76	.06	99.0
8248	do.	do.	W. H. Reid, Pilot Mountain, N. C.	97.67	1.99	.34	96.0
8379	do.	do.	H. S. Roberson & Co., Robersonville, N. C.	98.24	1.75	.01	94.5
8332	do.	do.	J. E. Sloop, Statesville, N. C.	97.11	2.46	.43	93.0

TABLE IV.—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Seed of Per Cent of	Inert Matter Per Cent of	Foreign Seed Per Cent of	Per Cent of Germination
8333	OATS.	N. R. Savage & Son, Richmond, Va.	J. E. Sloop, Statesville, N. C.	99.17	.76	.07	95.0
8317	do. (cheat)	do.	S. J. Stallings, Littleton, N. C.	97.96	1.60	.44	†87.0
8378	do. (cheat, corn cockle)	do.	do.	*95.62	3.62	.76	93.0
8174	do. (cheat, corn cockle)	do.	W. P. Ware, Reidsville, N. C.	*96.55	.76	2.69	94.5
8176	do.	do.	do.	98.04	1.96		97.5
8008	do.	do.	Hugh Woods, Roxboro, N. C.	*95.92	2.36	1.72	98.0
8011	do. (cheat)	do.	do.	*88.75	5.93	5.32	91.5
8456	do.	do.	do.	97.99	1.86	.15	96.5
8457	do.	Slate Seed Co., South Boston, Va.	Moore Bros. & Co., Roxboro, N. C.	*94.79	5.20	.01	99.0
8092	do.	Suffolk Seed and Feed Co., Suffolk, Va.	Davis Bros., Columbia, N. C.	97.59	1.92	.49	†79.5
8380	do. (cheat)	do.	P. A. Revis & Co., Louisville, N. C.	*95.55	2.52	1.93	96.5
8222	do.	do.	J. R. & J. G. Moye, Greenville, N. C.	*96.27	3.41	.32	94.5
8309	do. (wild mustard, corn cockle)	W. R. Tate, Nashville, Tenn.	do.				
8308	do.	T. W. Wood & Sons, Richmond, Va.	M. O. Blount & Sons, Bethel, N. C.	*75.91	7.80	16.59	†79.0
8022	do.	do.	L. J. Bradley & Co., Jackson, N. C.	*97.14	2.44	.42	98.5
8096	do.	do.	Carpenter Bros., Durham, N. C.	97.93	2.07		97.5
8025	do. (cheat, corn cockle, wild mustard)	do.	Walter Credle & Co., Washington, N. C.	98.53	1.15	.32	97.5
8188	do.	do.	George A. Durham, Hillsboro, N. C.	*93.21	4.98	1.81	†74.0
8203	do.	do.	M. B. Finch & Co., Spring Hope, N. C.	98.37	.74	.89	98.0
8177	do.	do.	N. T. Finch & Co., Spring Hope, N. C.	98.17	1.33	.50	97.0
8181	do.	do.	P. F. Lewis, Clinton, N. C.	99.11	.53	.36	93.5
8093	do.	do.	do.	*97.36	1.36	1.28	96.0
8178	do.	do.	T. P. Nash, Elizabeth City, N. C.	98.55	1.22	.13	99.0
7959	do.	do.	J. C. Peterson, Clinton, N. C.	98.75	.86	.19	96.5
8189	do.	do.	B. F. Powell, Clinton, N. C.	98.41	1.89		93.0
8097	do.	do.	do.	99.01	.47	.52	98.0
8254	do. (cheat)	do.	H. C. Privout, Edenton, N. C.	98.35	1.18	.47	96.0
		do.	W. H. Reid, Pilot Mountain, N. C.	*93.90	5.24	.86	93.5

TABLE IV. RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Pure Cent of Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
8073	RAPE.....	William G. Scarlett & Co., Baltimore, Md.	L. H. Caldwell, Lumberton, N. C.	99.69	.29	.02	78.5
8066	do.....	do.....	Hickory Seed Co., Hickory, N. C.	99.86	.06	.08	93.5
8122	do.....	do.....	W. J. Kirkman & Co., Wilmington, N. C.	99.81	.11	.08	78.5
8111	do.....	do.....	Rexall Drug Store, Burgaw, N. C.	99.82	.17	.01	90.5
8420	do.....	Slate Seed Co., South Boston, Va.	Durham Seed House, Durham, N. C.	99.82	.18		98.0
8435	do.....	T. W. Wood & Sons, Richmond, Va.	S. J. Adams, Raleigh, N. C.	99.73	.22	.05	93.0
8406	do.....	do.....	F. B. Ashcraft, Monroe, N. C.	99.84	.14	.02	95.5
8110	do.....	do.....	Walter Credle & Co., Washington, N. C.	99.88	.09	.03	90.0
8403	do.....	do.....	English Drug Co., Monroe, N. C.	99.93	.07		91.5
8065	do.....	do.....	Farmers Cash Seed and Feed Co., Winston-Salem, N. C.	99.89	.11		78.5
8277	do.....	do.....	do.....	99.58	.24	.18	91.0
8113	do.....	do.....	The Hardware Store, Siler City, N. C.	99.51	.43	.06	91.5
7949	do.....	do.....	C. Harrell & Sons, Burgaw, N. C.	99.94	.06		95.5
8496	do.....	do.....	Harris-McCauley Co., Norwood, N. C.	99.82	.14	.04	90.0
8207	do.....	do.....	J. E. Hood & Co., Kinston, N. C.	99.86	.14		99.5
8214	do.....	do.....	Isler & Peele, LaGrange, N. C.	99.70	.29	.01	94.5
8421	do.....	do.....	C. E. King & Sons, Durham, N. C.	99.88	.12		97.0
8209	do.....	do.....	W. P. Kornegay, Mount Olive, N. C.	99.62	.38		91.5
8497	do.....	do.....	Lineberger Seed Co., Gastonia, N. C.	99.81	.18	.01	92.5
7946	do.....	do.....	John S. McEachern & Sons, Wilmington, N. C.	99.78	.20	.02	96.0
8204	do.....	do.....	M. S. Merritt, Clinton, N. C.	99.49	.51		95.0
8206	do.....	do.....	E. S. Mewborn, LaGrange, N. C.	98.87	.13		98.0
8499	do.....	do.....	Morrow Bros. & Heath Co., Albemarle, N. C.	99.88	.12		93.0
8436	do.....	do.....	W. A. Myatt, Raleigh, N. C.	99.79	.21		97.5
8211	do.....	do.....	J. C. Peterson, Clinton, N. C.	99.58	.20	.22	78.0
8213	do.....	do.....	B. F. Powell, Clinton, N. C.	99.70	.29	.01	92.0
8116	do.....	do.....	Wallace Grocery Co., Wallace, N. C.	99.64	.36		78.5

8115	do	do	W. S. White & Co., Elizabeth City, N. C.	99.85	.10	.05	91.0
8498	do	Wood, Stubbs & Co., Louisville, Ky.	M. T. Little & Co., Albemarle, N. C.	99.81	.17	.02	173.0
8145	do	do	W. J. Nicks, Graham, N. C.	99.33	.27	.40	477.5
7951	do	do	Selma Supply Co., Selma, N. C.	99.87	.08	.05	170.0
8568	do	Dealer not given	L. R. Stricker, Asheville, N. C.	99.79	.21		96.5
REPROD	do	J. J. Buffington & Co., Baltimore, Md.	T. P. Nash, Elizabeth City, N. C.	97.07	2.84	.09	71.0
8130	do	do	W. S. White Co., Elizabeth City, N. C.	90.39	8.13	1.48	92.8
8129	do	Diggs & Beadles, Richmond, Va.	E. P. Carter Co., Washington, N. C.	90.06	4.42	5.52	79.8
8444	do	do	Hugh Woods, Roxboro, N. C.	91.57	5.33	3.10	76.5
8443	do	do	J. P. Wyatt's Sons Co., Raleigh, N. C.	92.05	6.15	1.80	77.3
8030	do	Hardin, Hamilton & Lewman, Louisville, Ky.	English Drug Co., Monroe, N. C.	*82.64	12.55	4.81	90.5
7920	do	do	John E. Fain, Murphy, N. C.	90.62	1.95	85.5	
8165	do	do	W. P. Ware, Reidsville, N. C.	*78.19	18.11	3.70	77.0
8162	do	National Seed Co., Louisville, Ky.	W. E. Merritt Co., Mount Airy, N. C.	*88.91	10.60	.49	79.3
8233	do	do	F. L. Smith Hdw. Co., Mount Airy, N. C.	91.38	8.43	.19	76.3
8294	do	Roanoke Seed and Supply Co., Roanoke, Va.	Conrad Hardware Co., Lexington, N. C.	92.25	6.78	.97	78.5
8234	do	do	S. W. Fulk Hdw. Co., Pilot Mountain, N. C.	*87.60	9.09	3.31	75.8
8293	do	do	S. L. Owen, Lexington, N. C.	91.65	7.60	.75	73.8
8337	do	do	J. E. Sloop, Statesville, N. C.	91.49	5.62	2.89	168.8
8235	do	do	O. N. Swanson, Pilot Mountain, N. C.	92.22	7.01	.77	156.0
8271	do	N. R. Savage & Son, Richmond, Va.	C. Call, North Wilkesboro, N. C.	*88.01	7.60	4.39	71.8
8336	do	do	Iredell Farmers' Union Warehouse Co., Statesville, N. C.	*89.30	8.62	2.08	79.3
8161	do	do	W. E. Merritt Co., Mount Airy, N. C.	91.63	5.89	2.48	74.3
8231	do	do	W. H. Reid, Pilot Mountain, N. C.	*81.61	9.10	9.29	78.5
8232	do	do	do	91.60	6.42	1.98	157.0
8028	do	William G. Scarlett & Co., Baltimore, Md.	Hickory Seed Co., Hickory, N. C.	91.82	6.82	1.36	95.8
8169	do	T. W. Wood & Sons, Richmond, Va.	City Seed Co., Hickory, N. C.	90.49	9.04	.47	70.0
8272	do	do	Farmers Cash Feed and Seed Co., Winston-Salem, N. C.	94.03	5.29	.65	74.3
8029	do	do	W. A. Leslie, Morganton, N. C.	96.42	3.12	.46	87.3
8446	do	do	Moore Bros. & Co., Roxboro, N. C.	93.42	5.40	1.18	166.3
8445	do	do	W. A. Myatt, Raleigh, N. C.	*66.25	17.55	16.20	157.5
8490	do	do	Norwood Drug Co., Norwood, N. C.	92.57	6.26	1.17	165.5
8335	do	do	Sherrill & Reere, Statesville, N. C.	90.62	8.24	1.14	168.0
8031	do	do	J. E. Sloop, Statesville, N. C.	94.23	5.20	.57	71.3
7019	do	Dealer not given	T. S. Morrison & Co., Asheville, N. C.	*84.02	9.38	6.60	76.3

TABLE IV—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer		Retail Dealer	Pure Seed of Per Cent of	Inert Matter of Per Cent of	Foreign Seed of Per Cent of	Per Cent of Germination
		Dealer not given	Adams Grain and Provision Co., Richmond, Va.					
7948	REDTOP.....	do	do	L. R. Stricker, Asheville, N. C.	91.02	7.41	1.57	84.5
7976	RYE.....	do	do	J. B. Johnston, Greenville, N. C.	*94.75	2.97	2.28	91.0
7963	do	do	do	H. C. Joyner, Rocky Mount, N. C.	*95.34	3.25	1.41	178.5
7967	do	do	do	J. R. & J. C. Moye, Greenville, N. C.	*93.53	3.29	3.18	169.0
8004	do	do	do	W. T. Parker & Co., Weldon, N. C.	98.01	1.86	.13	186.0
7998	do	do	do	J. D. Brooks, Oxford, N. C.	98.03	1.78	.19	90.5
7977	do	do	do	Charles B. Hill, New Bern, N. C.	98.04	.96	1.00	19.0
7965	do	do	do	Wilson & Hill, Warsaw, N. C.	97.58	1.29	1.13	159.5
7973	do	do	do	W. J. Kirkham & Co., Wilmington, N. C.	*93.23	1.94	4.83	172.5
7968	do	do	do	E. P. Carter & Co., Washington, N. C.	*96.70	3.20	.10	89.5
7975	do	do	do	P. L. Woodard & Co., Wilson, N. C.	*97.33	2.62	.05	96.0
8002	do	do	do	Sanders Grocery Co., Henderson, N. C.	98.82	.55	.63	161.0
8005	do	do	do	White, Hight & Co., Henderson, N. C.	98.94	.75	.31	96.5
8459	do	do	do	Hickory Seed Co., Hickory, N. C.	*97.00	1.77	1.23	183.5
8126	do	do	do	W. S. White & Co., Elizabeth City, N. C.	98.49	1.34	.17	175.5
8003	do	do	do	H. W. & J. C. Webb, Hillsboro, N. C.	99.01	.67	.32	137.5
8085	do	do	do	M. L. McRae, Maxton, N. C.	*97.36	1.95	.69	172.5
7971	do	do	do	Hardison & Hardison, Wadesboro, N. C.	97.95	1.65	.40	94.5
7970	do	do	do	Austin Stephenson, Smithfield, N. C.	98.27	1.35	.38	179.0
7964	do	do	do	Edwards & Co., Scotland Neck, N. C.	*87.09	1.87	11.04	173.5
7966	do	do	do	A. S. Huske, Fayetteville, N. C.	*97.13	1.67	1.20	148.5
8437	do	do	do	S. J. Adams, Raleigh, N. C.	98.96	.34	.70	95.5
8001	do	do	do	Carolina Warehouse, Greensboro, N. C.	99.18	.82	-----	140.5
8000	do	do	do	George A. Durham, Hillsboro, N. C.	*95.57	3.37	1.06	188.5
7962	do	do	do	F. W. Hargett & Sons, Jacksonville, N. C.	*97.43	1.92	.65	97.5
7969	do	do	do	C. Harrell & Sons, Burgaw, N. C.	*97.33	1.57	1.10	91.0
7974	do	do	do	W. D. Kelly, Clinton, N. C.	*95.42	4.16	.42	93.0

7972	do	do	John S. McEachern & Sons, Wilmington, N. C.	98.96	.95	179.0
7999	do	do	J. T. Turner, Ashelboro, N. C.	98.14	1.53	172.5
8215	do	(corn cockle)	J. P. Walters, LaGrange, N. C.		2.55	176.0
7924	do	Dealer not given	L. R. Stricker, Asheville, N. C.	98.90	.61	189.0
8598	Timothy	T. W. Aiken	Grant's Pharmacy, Asheville, N. C.	99.43	.43	95.0
8593	do	S. T. Beveridge & Co., Richmond, Va.	J. H. Dimore, Bryson City, N. C.	99.12	.54	96.0
8200	do	do	Jeffreys & Sons, Goldsboro, N. C.	98.23	.64	18.8
8108	do	do	J. M. McQueen, Gulf, N. C.	98.58	.49	173.5
8592	do	do	Madison Hdw. Co., Marshall, N. C.	96.57	1.93	160.3
8124	do	do	W. S. White & Co., Elizabeth City, N. C.	98.97	.54	179.3
8439	do	do	J. P. Wyatt's Sons Co., Raleigh, N. C.	99.80	.10	91.0
8524	do	Hackney, Broyles & Luckey, Knoxville, Tenn.				
8595	do	do	R. N. Ramsey, Marshall, N. C.	98.28	.57	93.5
7900	do	do	E. R. Tweed, Marshall, N. C.	98.94	.77	96.8
8603	do	do	John E. Fain, Murphy, N. C.	98.80	.96	88.3
8159	do	do	do	99.29	.47	97.0
7897	do	do	W. P. Ware, Reidsville, N. C.	98.41	.84	183.5
8594	do	do	Houston & Son, Hendersonville, N. C.	99.05	.52	89.8
7.01	do	do	Sylva Supply Co., Sylva, N. C.	98.45	.97	95.0
8158	do	do	do	98.98	.51	91.8
8230	do	do	W. E. Morrill Co., Mount Airy, N. C.	96.96	2.01	96.0
8227	do	do	F. L. Smith Hdw. Co., Mount Airy, N. C.	99.20	.25	96.5
8012	do	do	S. W. Fulk Hdw. Co., Pilot Mountain, N. C.	98.43	.90	91.0
8296	do	do	High Point Hdw Co., High Point, N. C.	99.06	.66	92.8
8340	do	do	S. L. Owen, Lexington, N. C.	98.61	.91	172.5
8274	do	do	J. E. Sloop, Statesville, N. C.	98.26	.82	96.5
8160	do	do	C. Call, North Wilkesboro, N. C.	97.10	.62	87.3
8139	do	do	Mount Airy Feed Store, Mount Airy, N. C.	99.41	.39	96.8
8341	do	do	Scott Seed Co., Greensboro, N. C.	99.55	.35	95.3
7899	do	do	C. C. Adams, Salisbury, N. C.	98.92	.54	98.3
8059	do	do	Grant's Pharmacy, Asheville, N. C.	99.63	.23	93.3
8228	do	do	Hickory Seed Co., Hickory, N. C.	99.08	.39	157.5
8601	do	do	W. H. Reid, Pilot Mountain, N. C.	99.17	.34	91.8
8125	do	do	D. K. Collins, Bryson City, N. C.	98.85	.60	173.3
7898	do	do	Bewson Hardware Co., High Point, N. C.	*85.60	1.58	12.82
	do	do	Bly Hardware Co., Hendersonville, N. C.	99.01	.66	179.8

TABLE IV.—RESULTS OF TESTS OF 29 KINDS OF AGRICULTURAL SEEDS, 686 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917.—CONTINUED.

Laboratory Number	Kind of Seed and Name of Unlawful Seed Present	Wholesale Dealer	Retail Dealer	Per Cent of Pure Seed	Per Cent of Inert Matter	Per Cent of Foreign Seed	Per Cent of Germination
8465	TIMOTHY	T. W. Wood & Sons, Richmond, Va.	City Feed Co., Hickory, N. C.	98.27	.79	.94	95.5
8273	do	do	Farmers Cash Seed and Feed Co., Winston-Salem, N. C.	98.70	.48	.82	†73.0
8383	do	do	J. H. Hall, Oxford, N. C.	99.21	.59	.20	97.5
8485	do	do	Lincoln Farmers' Union Warehouse Co., Lincolnton, N. C.	97.40	1.01	1.59	95.0
8489	do	do	Lineberger Seed Co., Gastonia, N. C.	98.92	.75	.33	97.0
8600	do	do	W. H. McClure, Hazelwood, N. C.	99.71	.24	.05	97.5
8596	do	do	J. T. Moore, Franklin, N. C.	98.96	.57	.47	94.8
8438	do	do	Moore Bros. Co., Roxboro, N. C.	98.97	.54	.59	97.5
8491	do	do	Norwood Drug Co., Norwood, N. C.	98.06	1.39	.55	†69.3
8060	do	do	Riggan Seed and Feed Co., Winston-Salem, N. C.	*92.85	1.53	5.62	90.8
8339	do	do	Sherrill & Reece, Statesville, N. C.	99.35	.45	.20	95.0
8399	do	do	Coburn R. Wiggins, Robbinsville, N. C.	98.50	.63	.87	†2.0
7902	do	Dealer not given.	T. S. Morrison & Co., Asheville, N. C.	98.50	.33	1.17	87.0
8597	do	do	do	99.12	.34	.54	94.8
7903	do	do	L. R. Stricker, Asheville, N. C.	98.89	.53	.58	†81.5
8602	do	do	do	99.44	.33	.23	97.5
VETCH, HARRY (corn cockle)	do	Carter, Venable & Co., Richmond, Va.	Gates & Hodges, Greenville, N. C.	97.42	.13	2.45	60.0
8196	do (corn cockle)	do	J. D. Winstead, Nashville, N. C.	98.57	.06	1.37	70.0
8119	do (corn cockle)	Diggs & Beadles, Richmond, Va.	E. P. Carter Co., Washington, N. C.	98.25	.61	1.14	74.0
8346	do	I. L. Radwaner, New York, N. Y.	C. C. Adams, Salisbury, N. C.	99.64	.36	---	54.5
7933	do	William G. Scarlett & Co., Baltimore, Md.	A. S. Huske, Fayetteville, N. C.	98.93	.07	1.00	82.5
8404	do	T. W. Wood & Sons, Richmond, Va.	Fox & Lyon, Wadesboro, N. C.	99.86	.07	.07	29.0
8195	do	do	J. B. Johnston, Greenville, N. C.	99.25	.20	.55	73.5
8042	do	do	Lineberger Seed Co., Gastonia, N. C.	99.40	.45	.45	81.0
8040	do	do	Riggan Seed and Feed Co., Winston-Salem, N. C.	98.48	.13	1.60	79.0

8041	do.....	do.....	J. E. Sloop, Statesville, N. C.....	99.26	.41	.33	80.0
8118	do.....	do.....	W. S. White & Co., Elizabeth City, N. C.....	98.94	.33	.73	64.5
7922	do.....	Dealer not given.....	L. R. Stricker, Asheville, N. C.....	97.57	---	2.43	84.0
8405	WHEAT, SPRING.....	T. W. Wood & Sons, Richmond, Va.....	English Drug Co., Monroe, N. C.....	100.00	---	---	97.5
8262	do.....	do.....	Farmers Cash Feed and Seed Store, Winston-Salem, N. C.....	99.80	.20	---	100.0
8120	do.....	do.....	W. S. White & Co., Elizabeth City, N. C.....	99.35	.21	.44	94.5
8086	do.....	do.....	Brown Mercantile Co., Chadbourne, N. C.....	99.93	.07	---	187.0
8052	do.....	do.....	Farmers Cash Feed and Seed Store, Winston-Salem, N. C.....	99.38	.62	---	182.5

TABLE V.—SUMMARY OF RESULTS OF TESTS OF 35 KINDS OF AGRICULTURAL SEEDS, 1,015 SAMPLES IN ALL, SUBMITTED BY INSPECTORS, AND INDIVIDUALS FROM JULY 1, 1916, TO JULY 1, 1917.

KIND OF SEED	Purity Test				Foreign Seed						Germination Test					
	Inert Matter				Pure Seed						Inert Matter					
	For Germination				Standard						Per Cent					
	Samples from Inspectors	Samples from Individuals	Total Samples Received	For Purity	Per Cent	Highest	Lowest	Average	Per Cent	Standard	Per Cent	Highest	Lowest	Average	Per Cent	Average
ALFALFA.....	11	23	34	34	96	99.98	92.72	93.76	1.82	.02	.48	5.46	80	93.5	28.0	75.78
BARLEY.....	1	1	1	1	98	98.94			.33			.73	90	85.0	22.0	67.37
BEANS, SOJA.....	1	6	7	7												
BEANS, VELVET.....	1	1	1	1												
BLUE GRASS, KY.....	42	3	45	45	80	87.26	48.52	78.25	42.91	11.23	20.25	33.33	45	78.0	0.5	34.00
BUCKWHEAT, JAP.....	1	1	1	1	96	92.24			4.64			3.12	90	89.0		
CLOVER, ALSIKE.....	8	5	13	13	96	98.69	93.47	97.24	.94	.10	.45	5.59	75	92.0	64.5	80.98
CLOVER, BURR.....	2	2	4	4	3	95.33	89.85	91.72	9.85	4.31	7.92	43	30	36	8.0	66.37
CLOVER, CRIMSON.....	36	52	88	88	98	99.16	87.61	98.36	11.50	.66	1.94	7.33	85	97.5	22.0	84.85
CLOVER, RED.....	109	35	144	144	92	99.75	71.45	97.06	5.47	.10	.90	23.94	80	97.5	4.0	85.64
CLOVER, SWEET.....	4	8	12	12	7	99.55	95.35	97.58	3.15	.35	1.58	3.79	75	83.3	58.8	72.64
CLOVER, WHITE.....	4	3	7	7	90	97.72	95.11	96.08	.82	.24	.59	4.45	94	100.0	66.0	95.50
CORN, FIELD.....	42	56	98	98	90											
COTTON.....		1	1	1	1											
COWPEAS.....		26	26	26												
FESCUE, MEADOW.....	4	1	5	5	95	99.03	94.15	96.91	4.24	.81	1.81	2.26	85	71.5	24.5	48.40
FESCUE, SHEEP.....		1	1	1		92.83			7.12			.05		34.0		
GRASS, CRESTED DOG'S TAIL.....		1	1	1	1	98.15			.36			1.49				
GRASS, ITALIAN RYE.....	5	1	6	6	95	97.00	91.07	94.91	6.46	1.71	3.91	3.12	80	79.5	6.0	53.75
GRASS, ORCHARD.....	53	4	57	57	70	91.14	29.09	74.26	70.86	7.65	23.04	20.08	70	94.0	49.5	80.70
GRASS, SUDAN.....	4			4		98.66	94.54	96.65	2.47	1.34	2.00	3.55		79.5	66.0	74.77
GRASS, TALL OAT.....	10	2	12	12	72	93.00	64.05	83.26	33.42	4.98	13.62	9.28	70	94.5	13.5	62.58
MILLET, GERMAN.....	17		17	17	90	99.57	95.87	98.65	3.88	.04	.84	1.41	85	97.5	9.5	74.20

MILLET, PEARL.....	6	186	6	186	6	99	99.29	98.25	98.54	1.75	.49	1.03	.31	---	.40	65	87.5	68.0	75.33
OATS.....	150	36	---	---	---	98	99.39	75.91	96.81	7.80	.26	2.31	16.29	---	.88	90	100.0	7.0	89.19
PASPALUM.....	1	1	1	1	1	---	74.20	---	---	25.45	---	---	.35	---	---	---	7.5	---	---
PEAS, CANADA FIELD.....	1	1	1	1	1	---	---	---	---	---	---	---	---	---	---	---	90.5	---	---
PEANUTS.....	1	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	46.5	---	---
RAPE.....	52	3	55	55	55	99	99.97	99.33	99.79	.51	.03	.18	.40	---	.04	90	99.5	70.0	89.91
REDTOP.....	31	12	43	43	42	90	97.07	66.25	90.16	18.11	2.84	9.28	16.20	---	.09	70	95.8	56.0	78.07
RYE.....	30	27	57	57	57	98	99.75	87.09	97.20	4.16	.24	1.59	11.04	---	---	29	90.0	3.0	68.91
TIMOTHY.....	47	11	58	58	58	96	99.80	85.40	98.48	2.01	.10	.65	12.82	---	.05	85	98.8	2.0	84.07
VETCH, HAIRY.....	12	5	17	16	17	---	99.86	---	92.49	.81	---	.27	99.14	---	---	---	81.0	29.0	68.22
VETCH, SPRING.....	3	---	3	3	3	---	100.00	99.35	99.72	.21	---	.14	.44	---	---	---	100.0	94.5	97.33
WHEAT.....	2	2	4	4	4	98	99.93	99.38	99.70	.62	.07	.25	.20	---	.05	90	97.0	82.5	89.87

NOTE.—Six samples of vegetable seeds were tested for individuals, but are not included in any other charts.

TABLE VI.—RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS. 667 SAMPLES IN ALL, COLLECTED BY INSPECTORS
FROM JULY 15, 1916, TO JULY 15, 1917

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12307	BEANS.....	W. W. Barnard Co., Chicago, Ill.	English & Oliver, Mount Olive, N. C.	99.0
12261	do.....	do.....	W. J. Kirkman & Co., Wilmington, N. C.	86.0
12116	do.....	do.....	do.....	96.0
12263	do.....	do.....	do.....	62.5
12309	do.....	do.....	W. P. Kornegay, Mount Olive, N. C.	96.0
12315	do.....	do.....	Palace Drug Co., Goldsboro, N. C.	93.0
12352	do.....	do.....	do.....	94.0
12639	do.....	J. Bolgiano & Son, Baltimore, Md.	Hart Drug Co., Norwood, N. C.	97.0
12262	do.....	Robert Buist Co., Philadelphia, Pa.	Blount's Pharmacy, Washington, N. C.	96.0
12117	do.....	do.....	do.....	72.0
12471	do.....	do.....	R. E. L. Cook, Tarboro, N. C.	84.0
12462	do.....	do.....	do.....	94.0
12459	do.....	do.....	do.....	97.0
12617	do.....	do.....	Davis Pharmacy, Marion, N. C.	97.5
12614	do.....	do.....	do.....	93.5
12521	do.....	do.....	Gibson Drug Co., Concord, N. C.	95.5
12517	do.....	do.....	do.....	76.0
12664	do.....	do.....	Justus Pharmacy, Hendersonville, N. C.	97.0
12595	do.....	do.....	L. A. Kincaid, Morganton, N. C.	98.0
12592	do.....	do.....	W. A. Ross & Sons, Morganton, N. C.	91.5
12533	do.....	do.....	F. L. Smith Drug Co., Kannapolis, N. C.	96.5
12520	do.....	do.....	do.....	95.5
12431	do.....	do.....	C. R. Thomas Drug Co., Thomasville, N. C.	97.5
12430	do.....	do.....	do.....	97.5
12429	do.....	do.....	do.....	89.0
12404	do.....	do.....	Thompson Drug Co., Winston-Salem, N. C.	93.5
12402	do.....	do.....	do.....	91.5
12401	do.....	do.....	do.....	51.0
12405	do.....	do.....	do.....	

12400	do.	Thompson Drug Co., Winston-Salem, N. C.	97.5
12282	do.	I. W. West, Mount Airy.	92.5
12280	do.	do.	98.0
12277	do.	do.	93.5
12330	do.	do.	93.0
12266	do.	Garden Drug Store Co., Greensboro, N. C.	64.0
12322	do.	Jeffreys & Son, Goldsboro, N. C.	93.0
12130	do.	W. J. Kirkman & Co., Wilmington, N. C.	91.0
12327	do.	E. A. Rosemond, Hillsboro, N. C.	95.5
12281	do.	W. P. Ware, Reidsville, N. C.	79.5
12114	do.	Gaston & Terry, Hamlet, N. C.	99.0
12317	do.	J. B. Jolluston, Greenville, N. C.	46.5
12311	do.	do.	92.0
12213	do.	T. L. Worsley, Rocky Mount, N. C.	88.0
12316	do.	do.	92.0
12530	do.	Charlotte Drug Co., Charlotte, N. C.	80.0
12069	do.	D. W. Fort, Roseboro, N. C.	80.5
12033	do.	J. H. Monger, Sanford, N. C.	95.0
12036	do.	do.	87.5
12500	do.	P. F. Newton & Co., Morganton, N. C.	74.5
12586	do.	W. A. Ross & Sons, Morganton, N. C.	100.0
12503	do.	do.	97.0
12634	do.	Walker Bargain House, Mocksville, N. C.	95.5
12640	do.	do.	92.0
12470	do.	Burroughs-Pittman-Wheeler Co., Scotland Neck, N. C.	47.0
12587	do.	Hickory Seed Co., Hickory, N. C.	98.5
12611	do.	Farmers Hardware Co., Forest City, N. C.	95.5
12531	do.	Davis & Wolfe, Charlotte, N. C.	77.0
12382	do.	Gibsonville Drug Co., Gibsonville, N. C.	46.9
12091	do.	King Grocery Co., Lumberton, N. C.	21.0
12461	do.	E. Clark, Weldon, N. C.	59.0
12458	do.	do.	92.0
12327	do.	T. P. Cobb, Wilson, N. C.	10.0
12312	do.	do.	81.0
12324	do.	do.	88.0
12260	do.	Walter Credle & Co., Washington, N. C.	99.0
12318	do.	J. D. Daniels, Goldsboro, N. C.	50.0
12331	do.	E. F. Faison, Faison, N. C.	91.0
12329	do.	do.	100.0

TABLE VI.—RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS, 667 SAMPLES IN ALL, COLLECTED BY INSPECTORS
FROM JULY 15, 1916, TO JULY 15, 1917.—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12591	BEANS	D. Landreth Seed Co., Bristol, Pa.	Freeze Drug Co., Newton, N. C.	95.0
12589	do	do	do	95.0
12658	do	do	Grant's Pharmacy, Asheville, N. C.	99.0
12659	do	do	do	65.0
12662	do	do	do	94.0
12663	do	do	do	80.0
12636	do	do	Hart Drug Co., Norwood, N. C.	93.5
12333	do	do	J. E. Hood & Co., Kinston, N. C.	98.0
12126	do	do	Charles L. Johnson, Warsaw, N. C.	95.0
12467	do	do	Sherrill & Reece, Statesville, N. C.	88.0
12465	do	do	do	81.5
12111	do	do	J. E. Welch, High Point, N. C.	91.5
12115	do	do	do	68.5
12122	do	do	do	97.5
12123	do	do	do	94.5
12124	do	do	do	62.5
12125	do	do	do	87.0
12532	do	Leonard Seed Co., Chicago, Ill.	Charlotte Drug Co., Charlotte, N. C.	94.5
12524	do	do	do	93.5
12537	do	do	do	97.0
12574	do	do	Covington-Rodgers Drug Co., Durham, N. C.	93.0
12575	do	do	do	96.0
12529	do	do	W. L. Hand & Co.	79.0
12519	do	do	do	88.5
12905	do	do	do	86.0
12334	do	do	do	100.0
12310	do	do	J. E. Hood & Co., Kinston, N. C.	93.0
12328	do	do	Jeffreys & Son, Goldsboro, N. C.	46.5
12129	do	do	Charles L. Johnson, Warsaw, N. C.	84.0

12680	do	do	Justus Pharmacy, Hendersonville, N. C.	86.0
12691	do	do	do	93.0
12325	do	do	Ruffin-High Co., Wilson, N. C.	90.0
12326	do	do	do	62.0
12038	do	do	Sanford Supply Co., Sanford, N. C.	97.0
12576	do	do	S. J. Adams, Raleigh, N. C.	97.5
12507	do	do	Durham Seed Co., Durham, N. C.	90.5
12566	do	do	do	99.5
12127	do	do	J. H. Harding, Wilmington, N. C.	97.0
12132	do	do	do	96.0
12131	do	do	do	97.0
12569	do	do	do	97.0
12570	do	do	do	95.5
12571	do	do	do	96.0
12572	do	do	do	97.5
12469	do	do	W. W. Parker, Henderson, N. C.	49.5
12460	do	do	do	98.0
12265	do	do	Scott Seed Co., Greensboro, N. C.	84.0
12264	do	do	do	75.0
12267	do	do	do	81.5
12314	do	do	W. H. Tillman, Mount Olive, N. C.	77.0
12118	do	do	W. S. White & Co., Elizabeth City, N. C.	100.0
12128	do	do	do	96.0
12568	do	do	Covington-Rodgers Drug Co., Durham, N. C.	85.0
12034	do	do	Granham Bros., Lumberton, N. C.	87.0
12037	do	do	do	80.5
12304	do	do	Isler & Peele, LaGrange, N. C.	94.0
12310	do	do	do	49.0
12563	do	do	C. E. King & Sons, Durham, N. C.	95.0
12573	do	do	do	63.0
12320	do	do	H. C. Precise, Faison, N. C.	92.0
12616	do	do	J. D. Bland, Marion, N. C.	98.0
12341	do	do	Burlington Drug Co., Burlington, N. C.	76.0
12596	do	do	Clarence Clapp, Newton, N. C.	75.0
12597	do	do	do	0.0
12463	do	do	Ferguson Drug Co., Halifax, N. C.	100.0
12468	do	do	do	84.0
12588	do	do	Freze Drug Co., Newton, N. C.	81.0
12340	do	do	Gibsonville Drug Co., Gibsonville, N. C.	81.5
12612	do	do	Harris-McNeely Co., Mooresville, N. C.	72.0

TABLE VI.—RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS, 667 SAMPLES IN ALL, COLLECTED BY INSPECTORS
FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12643	BEANS	T. W. Wood & Sons, Richmond, Va.	Harris-McNeely Co., Mooresville, N. C.	95.5
12276	do.	do.	Hawks-Rothrock Drug Co., Mount Airy, N. C.	78.5
12278	do.	do.	do.	88.0
12279	do.	do.	do.	80.5
12287	do.	do.	do.	97.0
12457	do.	do.	L. P. Hicks, Louisburg, N. C.	65.5
12308	do.	do.	Y. H. Knowles Co., Mount Olive, N. C.	79.0
12323	do.	do.	do.	94.0
12112	do.	do.	Mann Drug Co., High Point, N. C.	92.0
12113	do.	do.	do.	83.0
12632	do.	do.	Morrow Bros. & Heath Co., Albemarle, N. C.	97.0
12638	do.	do.	do.	69.0
12594	do.	do.	P. F. Newton & Co., Morganton, N. C.	78.5
12428	do.	do.	J. B. Smith Co., Lexington, N. C.	90.0
12351	do.	do.	do.	88.5
12120	do.	do.	M. R. Sprinkle, Beaufort, N. C.	96.0
12217	do.	do.	J. T. Turner, Asheboro, N. C.	95.0
12466	do.	do.	C. C. Adams, Salisbury, N. C.	92.0
12035	do.	do.	Brown Mercantile Co., Chadbourn, N. C.	89.5
12031	do.	do.	do.	82.5
12119	do.	do.	E. P. Carter Co., Washington, N. C.	89.0
12121	do.	do.	do.	98.0
12523	do.	do.	W. G. Glass, Concord, N. C.	95.0
12518	do.	do.	do.	97.5
12336	do.	do.	Joseph A. Isley & Bros. Co., Burlington, N. C.	96.0
12339	do.	do.	do.	86.0
12612	do.	do.	Henry E. Kendall, Shelby, N. C.	94.5
12613	do.	do.	do.	89.5
12615	do.	do.	do.	89.5

12619	do	do	do	93.0
12640	do	do	W. L. Kluttz, Salisbury, N. C.	94.0
12644	do	do	Lineberger Seed Co., Gastonia, N. C.	94.5
12641	do	do	do	97.0
12635	do	do	do	91.0
12633	do	do	do	85.5
12637	do	do	M. F. Little & Co., Albemarle, N. C.	96.5
12538	do	do	Lowe Bros. & Co., Kannapolis, N. C.	97.0
12522	do	do	do	83.0
12338	do	do	W. J. Nicks, Graham, N. C.	94.0
12032	do	do	Pace Grocery Co., Maxton, N. C.	88.5
12039	do	do	do	92.0
12399	do	do	Riggan's Feed and Seed Store, Winston-Salem, N. C.	100.0
12403	do	do	do	97.0
12393	do	do	A. T. Rothrock, Walnut Cove, N. C.	86.5
12306	do	do	Ruffin-High Co., Wilson, N. C.	97.0
12321	do	do	do	92.0
12618	do	do	J. H. Rudisill & Co., Lenoirton, N. C.	98.0
12335	do	do	do	91.5
12349	do	do	J. W. Tisdale, Burlington, N. C.	88.5
12661	do	do	Stricker Seed Co., Asheville, N. C.	40.5
12666	do	do	do	47.0
12637	do	do	do	100.0
12657	do	do	do	76.0
12665	do	do	do	92.5
12490	BEETS	do	Burroughs Grocery Co., Warrenton, N. C.	74.5
12516	do	do	D. M. Campbell, Halifax, N. C.	79.0
12418	do	do	T. P. Cobb, Wilson, N. C.	81.0
12404	do	do	W. T. Parker & Co., Weldon, N. C.	77.5
12055	do	do	Rice & Faison, Hamlet, N. C.	75.0
12288	do	do	Palace Drug Co., Goldsboro, N. C.	75.0
12280	do	do	do	79.0
12133	do	do	Blount's Pharmacy, Washington, N. C.	10.0
12096	do	do	L. H. Caldwell, Lumberton, N. C.	79.5
12177	do	do	Kress Store, Wilmington, N. C.	49.0
12274	do	do	Garden Drug Store Co., Greensboro, N. C.	68.5
12100	do	do	R. L. Anthony, Louisville, N. C.	83.0
12203	do	do	W. S. Blanchard & Son, Hertford, N. C.	78.5
12481	do	do	E. S. Bowers, Jackson, N. C.	87.0

TABLE VI. RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS, 667 SAMPLES IN ALL, COLLECTED BY INSPECTORS
FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12075	BEEFS	Crosman Bros. Co., Rochester, N. Y.	Brown Mercantile Co., Chadbourn, N. C.	79.0
12190	do	do	A. J. Cox & Co., Washington, N. C.	77.5
12475	do	do	L. P. Hicks, Louisville, N. C.	61.0
12232	do	do	L. W. Lineberry, Randleman, N. C.	75.5
12032	do	do	W. L. London & Sons, Pitsboro, N. C.	84.5
12685	do	do	MacIpe-Breggin Drug Co., Brevard, N. C.	82.0
12181	do	do	Micher's Pharmacy, Edenton, N. C.	89.0
12497	do	do	J. L. Roberson & Co., Robertsonville, N. C.	33.0
12071	do	do	Sanford Supply Co., Sanford, N. C.	76.5
12108	do	do	W. R. Sprinkle, Beaufort, N. C.	84.0
12199	do	do	T. E. White, Edenton, N. C.	75.5
12507	do	do	E. T. Whitehead Co., Scotland Neck, N. C.	58.5
12433	do	D. M. Ferry & Co., Detroit, Mich.	Allred & Govett, Clima, N. C.	83.5
12555	do	do	T. M. Bynum, Goldston, N. C.	82.5
12396	do	do	C. Call, North Wilkesboro, N. C.	75.5
12680	do	do	Coburn & Wiggins, Robbinsville, N. C.	79.0
12675	do	do	D. K. Collins, Cherokee, N. C.	84.5
12158	do	do	C. R. Curdis, Liberty, N. C.	69.5
12193	do	do	Davis Bros., Columbia, N. C.	82.5
12066	do	do	D. W. Fort, Roseboro, N. C.	82.5
12627	do	do	Fox & Kelly, Lenoir, N. C.	79.0
12362	do	do	Hayes Drug Store, Graham, N. C.	71.5
12380	do	do	Joseph A. Isley & Bros. Co., Burlington, N. C.	82.5
12179	do	do	B. C. Jones, South Mills, N. C.	78.0
12690	do	do	E. B. King, Tipton, N. C.	77.5
12653	do	do	Marrow-Freeman Co., Norwood, N. C.	84.0
12425	do	do	M. S. Merritt & Co., Clinton, N. C.	78.0
12369	do	do	Miles-Nelson-Ray Co., Mebane, N. C.	74.0
12582	do	do	Moore Bros. & Co., Roxboro, N. C.	78.0

12154	do	McPherson & Co., Liberty, N. C.	80.5
12209	do	Mount Gilead Store Co., Mount Gilead, N. C.	74.5
12433	do	Parker & Newton, Farmville, N. C.	81.5
12606	do	W. A. Ross & Sons, Morganton, N. C.	80.5
12646	do	C. C. Sanford Sons Co., Mocksville, N. C.	78.5
12227	do	Nance Tomlinson, Troy, N. C.	85.0
12548	do	Watson-King Co., Rockingham, N. C.	74.5
12413	do	I. W. West, Mount Airy, N. C.	82.0
12413	do	White & Shaffner, Climax, N. C.	81.5
12476	do	Burrongs-Pitman-Wheeler Co., Scotland Neck, N. C.	78.5
12512	do	W. J. Hodges, Williamston, N. C.	70.0
12091	do	King Grocery Co., Lumberton, N. C.	76.5
12372	do	Freeman Drug Co., Burlington, N. C.	72.0
12602	do	Freeze Drug Co., Newton, N. C.	81.5
12205	do	W. S. White & Co., Elizabeth City, N. C.	44.0
12671	do	Justus Pharmacy, Hendersonville, N. C.	77.0
12131	do	Walter Credle & Co., Washington, N. C.	86.5
12064	do	A. S. Huske, Fayetteville, N. C.	68.5
12081	do	do	79.5
12550	do	Gibsonville Drug Co., Gibsonville, N. C.	76.5
12784	do	P. O. Leggett, Southport, N. C.	87.0
12241	do	Tucker & Erwin, Greensboro, N. C.	88.5
12234	do	do	84.0
12484	do	W. M. Matthews, Drum Hill, N. C.	80.0
12492	do	Burrongs Grocery Co., Warrenton, N. C.	98.0
12513	do	D. M. Campbell, Halifax, N. C.	66.5
12117	do	T. P. Cobb, Wilson, N. C.	80.5
12495	do	W. T. Parker & Co., Weldon, N. C.	65.0
12085	do	L. H. Caldwell, Lumberton, N. C.	71.5
12176	do	Kress Store, Wilmington, N. C.	100.0
12483	do	E. S. Bowers, Jackson, N. C.	74.0
12683	do	Macipe-Breggin Drug Co., Brevard, N. C.	2.0
12180	do	Mitcher's Pharmacy, Edenton, N. C.	33.9
12499	do	G. L. Robertson & Co., Robertsonville, N. C.	34.5
12167	do	W. R. Sprinkle, Beaufort, N. C.	57.0
12249	do	Troy Cafe, Troy, N. C.	90.5
12359	do	J. T. Turner, Asheboro, N. C.	5.0
12454	do	Allred & Gower, Climax, N. C.	87.5
12556	do	T. M. Bynum, Goldston, N. C.	69.0

TABLE VI.—RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS, 667 SAMPLES IN ALL. COLLECTED BY INSPECTORS
FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12394	CABBAGE.....	D. M. Ferry & Co., Detroit, Mich.	C. Call, North Wilkesboro, N. C.	82.5
12681	do.....	do.....	Coburn & Wiggins, Robbinsville, N. C.	90.5
12676	do.....	do.....	D. K. Collins, Cherokee, N. C.	78.5
12159	do.....	do.....	C. R. Curtis, Liberty, N. C.	77.5
12192	do.....	do.....	Davis Bros., Columbia, N. C.	91.5
12065	do.....	do.....	D. W. Fort, Roseboro, N. C.	66.5
12626	do.....	do.....	Fortune & King, Forest City, N. C.	73.5
12629	do.....	do.....	Fox & Kelly, Lincolnton, N. C.	77.0
12501	do.....	do.....	J. B. Gilliam, Windsor, N. C.	94.0
12381	do.....	do.....	Joseph A. Isley & Bros. Co., Burlington, N. C.	44.0
12171	do.....	do.....	B. C. Jones, South Mills, N. C.	90.0
12687	do.....	do.....	E. B. King, Tipton, N. C.	82.0
12424	do.....	do.....	M. S. Merritt & Co., Clinton, N. C.	76.5
12104	do.....	do.....	McDonald Hardware Co., McDonald, N. C.	68.0
12153	do.....	do.....	McPherson & Co., Liberty, N. C.	87.0
12420	do.....	do.....	Parker & Newton, Farmville, N. C.	77.5
12607	do.....	do.....	W. A. Ross & Sons, Morganton, N. C.	59.0
12229	do.....	do.....	Nance Thomlinson, Troy, N. C.	75.5
12552	do.....	do.....	Watson-King Co., Rockingham, N. C.	75.0
12414	do.....	do.....	J. W. West, Mount Airy, N. C.	68.5
12478	do.....	Griffith & Turner, Baltimore, Md.	Burroughs-Wheeler-Pittman Co., Scotland Neck, N. C.	50.0
12080	do.....	Lake Shore Seed Co., Dunkirk, N. Y.	King Grocery Co., Lumberton, N. C.	22.0
12080	do.....	Landreth Seed Co., Bristol, Pa.	J. F. Field, Louisburg, N. C.	34.0
12375	do.....	do.....	Freeman Drug Co., Burlington, N. C.	4.0
12604	do.....	do.....	Freeze Drug Co., Newton, N. C.	79.5
12206	do.....	do.....	W. S. White & Co., Elizabeth City, N. C.	0.0
12223	do.....	do.....	Scott Seed Co., Greensboro, N. C.	77.0
12486	do.....	George Tait & Sons, Norfolk, Va.	W. M. Matthews, Drum Hill, N. C.	83.0
12059	do.....	T. W. Wood & Sons, Richmond, Va.	A. S. Huske, Fayetteville, N. C.	85.5

12186	do	do	P. O. Leggett, Southport, N. C.	72.3
12219	do	do	J. T. Turner, Asheboro, N. C.	74.5
12259	do	do	Watson-King Co., Rockingham, N. C.	95.0
12448	do	do	Moore Bros., Thomasville, N. C.	59.0
12030	CATELOUPE	do	Gaston Terry, Hamlet, N. C.	86.5
10828	do	do	A. S. Huske, Fayetteville, N. C.	96.5
10829	do	do	J. W. Carter Co., Maxton, N. C.	85.0
12214	CARROTS	do	Garden Drug Store Co., Greensboro, N. C.	51.0
12407	do	do	C. Call, North Wilkesboro, N. C.	20.5
12072	do	do	Sanford Supply Co., Sanford, N. C.	13.5
12630	do	do	Fox & Kelly, Lincolnton, N. C.	61.5
12371	do	do	Miles-Nelson-Ray Co., Mebane, N. C.	67.5
12162	do	do	Wrenn Bros. Co., Siler City, N. C.	45.0
12238	do	do	Tucker & Erwin, Greensboro, N. C.	19.0
12188	COLLARDS	do	A. J. Cox & Co., Washington, N. C.	25.5
12070	do	do	Sanford Supply Co., Sanford, N. C.	87.0
12357	do	do	J. T. Turner, Asheboro, N. C.	88.0
12103	do	do	McDonald Hardware Co., McDonald, N. C.	77.5
12610	do	do	W. A. Ross & Sons, Morganton, N. C.	76.0
12060	do	do	W. A. S. Huske, Fayetteville, N. C.	97.5
12137	SWEET CORN	do	W. J. Perkins & Co., Wilmington, N. C.	74.5
12303	do	do	Jeffreys & Sons, Goldsboro, N. C.	74.0
12392	do	do	Burlington Drug Co., Burlington, N. C.	94.5
12580	do	do	Paul Webb, Shelby, N. C.	93.5
12436	CUCUMBER	do	Allred & Govett, Clinax, N. C.	63.0
12086	do	do	Eyrington Drug Store, Louisburg, N. C.	31.0
12361	do	do	Hayes Drug Co., Graham, N. C.	57.0
12377	do	do	Joseph A. Isley & Bros. Co., Burlington, N. C.	51.0
12368	do	do	Miles-Nelson-Ray Co., Mebane, N. C.	88.5
12609	do	do	W. A. Ross & Sons, Morganton, N. C.	36.0
12618	do	do	C. C. Sanford Sons' Co., Mocksville, N. C.	63.5
12391	do	do	W. J. Swanson, Pilot Mountain, N. C.	96.0
12228	do	do	Nance Thomlinson, Troy, N. C.	71.0
12385	do	do	Gibsonville Drug Co., Gibsonville, N. C.	37.5
12084	do	do	J. T. Fields, Louisburg, N. C.	95.0
12373	do	do	Freeman Drug Co., Burlington, N. C.	98.0
12605	do	do	Freeze Drug Co., Newton, N. C.	90.0
12560	do	do	Watson-King Co., Rockingham, N. C.	95.5
12416	do	do	Moore Bros., Thomasville, N. C.	97.0

TABLE VI. RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS, 657 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12076	Egg PLANT.	Crosman Bros. Co., Rochester, N. Y.	Brown Mercantile Co., Chadbourn, N. C.	24.0
12233	do	do	L. W. Lindeberry, Randleman, N. C.	17.5
12161	do	D. M. Ferry & Co., Detroit, Mich.	C. R. Curtis, Liberty, N. C.	62.0
12489	LETTUCE.	American Seed Co., Detroit, Mich.	Burroughs Grocery Co., Warrenton, N. C.	72.5
12496	do	do	W. T. Parker & Co., Weldon, N. C.	72.0
12178	do	W. D. Burt, Dalton, N. Y.	Kress Store, Wilmington, N. C.	83.5
12202	do	Crosman Bros. Co., Rochester, N. Y.	W. S. Blanchard & Son, Hertford, N. C.	80.5
12472	do	do	L. P. Hicks, Louisburg, N. C.	19.0
12053	do	do	W. L. London & Sons, Rochester, N. Y.	2.5
12500	do	do	J. L. Robertson & Co., Robersonville, N. C.	0.0
12508	do	do	E. T. Whithead Co., Scotland Neck, N. C.	12.0
12682	do	D. M. Ferry & Co., Detroit, Mich.	Coburn & Wiggins, Robbinsville, N. C.	86.5
12678	do	do	D. K. Collins, Cherokee, N. C.	80.5
12195	do	do	Davis Bros., Columbia, N. C.	91.0
12085	do	do	Evington Drug Co., Louisburg, N. C.	90.5
12502	do	do	J. B. Gilliam, Windsor, N. C.	82.0
12688	do	do	E. B. King, Tipton, N. C.	83.5
12422	do	do	Parker & Newton, Farmville, N. C.	75.5
12674	do	do	G. W. Revis, Barkers Creek, N. C.	82.5
12647	do	do	C. C. Sanford Sons Co., Mocksville, N. C.	93.5
12353	do	do	S. T. Thompson, Aurora, N. C.	23.0
12440	do	do	White & Shaffner, Climax, N. C.	86.5
12477	do	Griffith & Turner, Baltimore, Md.	Burroughs-Pittman-Wheeler Co., Scotland Neck, N. C.	95.0
12511	do	Lake Shore Seed Co., Duunkirk, N. Y.	W. J. Hodges, Williamston, N. C.	1.5
12092	do	do	King Grocery Co., Lumberton, N. C.	7.5
12601	do	D. Landreth Seed Co., Bristol, Pa.	Freeze Drug Co., Newton, N. C.	37.5
12224	do	Scott Seed Co., Greensboro, N. C.	Scott Seed Co., Greensboro, N. C.	95.5
12487	do	George Tut & Sons, Norfolk, Va.	W. M. Matthews, Drum Hill, N. C.	94.0
12220	do	T. W. Wood & Sons, Richmond, Va.	J. T. Turner, Ashboro, N. C.	81.5

12138	LIMA BEANS	Diggs & Beadles, Richmond, Va.	C. E. King & Sons, Durham, N. C.	74.0
12564	do	do	do	95.0
12526	do	Leonard Seed Co., Chicago, Ill.	W. L. Hand & Co., Charlotte, N. C.	26.0
12525	do	Jerome B. Rice Seed Co., Cambridge, N. Y.	Charlotte Drug Co., Charlotte, N. C.	92.0
12110	do	do	J. H. Harding, Wilmington, N. C.	98.0
12139	do	do	Haywood & Boone, Durham, N. C.	66.5
12024	do	T. W. Wood & Sons, Richmond, Va.	J. W. Carter Co., Maxton, N. C.	Mishad
12547	do	Wood, Stubbs & Co., Louisville, Ky.	English Drug Co., Monroe, N. C.	98.0
12620	do	do	Henry E. Kendall, Shelby, N. C.	98.0
12108	MUSKMELON	Crosman Bros. Co., Rochester, N. Y.	R. L. Anthony, Louisburg, N. C.	61.0
12077	do	do	Brown Mercantile Co., Chadbourne, N. C.	40.5
12235	do	do	L. W. Lineberry, Randleman, N. C.	64.0
12027	do	do	W. L. McRae, Maxton, N. C.	52.0
12073	do	do	Sanford Supply Co., Sanford, N. C.	45.0
12360	do	do	J. T. Turner, Ashelboro, N. C.	82.5
12624	do	D. M. Ferry & Co., Detroit, Mich.	Fortune & King, Forest City, N. C.	81.5
12651	do	do	Marrow-Freeman Co., Norwood, N. C.	70.5
12389	do	do	W. J. Swanson, Pilot Mountain, N. C.	77.0
12226	do	Scott Seed Co., Greensboro, N. C.	Scott Seed Co., Greensboro, N. C.	55.5
12230	do	T. W. Wood & Sons, Richmond, Va.	Tucker & Erwin, Greensboro, N. C.	62.0
12169	MUSTARD	Crosman Bros. Co., Rochester, N. Y.	W. R. Sprinkle, Beaufort, N. C.	86.5
12172	do	D. M. Ferry & Co., Detroit, Mich.	B. C. Jones, South Mills, N. C.	79.5
12427	do	do	M. S. Merritt & Co., Clinton, N. C.	16.5
12354	do	do	S. T. Thompson, Aurora, N. C.	31.0
12062	do	T. W. Wood & Sons, Richmond, Va.	A. S. Huske, Fayetteville, N. C.	91.5
12097	OKRA	Robert Buist Co., Philadelphia, Pa.	L. H. Caldwell, Lumberton, N. C.	74.0
12107	do	Crosman Bros. Co., Rochester, N. Y.	R. L. Anthony, Louisburg, N. C.	54.0
12078	do	do	Brown Mercantile Co., Chadbourne, N. C.	81.0
12406	do	do	C. Call, North Wilkesboro, N. C.	64.0
12363	do	D. M. Ferry & Co., Detroit, Mich.	Hayes Drug Co., Graham, N. C.	56.0
12388	do	do	W. J. Swanson, Pilot Mountain, N. C.	38.0
12241	do	do	White & Shaffner, Climax, N. C.	47.0
12165	do	do	Wrenn Bros. Co., Siler City, N. C.	78.0
12081	do	Landreth Seed Co., Bristol, Pa.	J. T. Fields, Louisburg, N. C.	76.0
12063	do	T. W. Wood & Sons, Richmond, Va.	A. S. Huske, Fayetteville, N. C.	83.0
12179	ONION	W. D. Burt, Dalton, N. Y.	Kress Store, Wilmington, N. C.	35.0
12248	do	Crosman Bros. Co., Rochester, N. Y.	Troy Cafe, Troy, N. C.	0.0
12398	do	D. M. Ferry & Co., Detroit, Mich.	C. Call, North Wilkesboro, N. C.	74.0
12088	do	do	Evington Drug Co., Louisburg, N. C.	69.0

TABLE VI.—RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS, 667 SAMPLES IN ALL, COLLECTED BY INSPECTORS
FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12631	ONION	D. M. Ferry & Co., Detroit, Mich.	Fox & Kelly, Lincolnton, N. C.	63.0
12655	do	do	Marrow-Freeman Co., Norwood, N. C.	75.5
12211	do	do	Mount Gilead Store Co., Mount Gilead, N. C.	63.5
12630	do	do	C. C. Sanford Sons' Co., Mocksville, N. C.	75.0
12230	do	do	Nance Thomlinson, Troy, N. C.	68.5
12240	do	do	Tucker & Erwin, Greensboro, N. C.	26.5
12412	PARSNIP	T. W. Wood & Sons, Richmond, Va.	L. W. West, Mount Airy, N. C.	35.5
12148	PEAS	D. M. Ferry & Co., Detroit, Mich.	W. J. Kirkman & Co., Wilmington, N. C.	41.0
12258	do	W. W. Barnard Co., Chicago, Ill.	do	80.0
12293	do	do	H. C. Precise, Faison, N. C.	29.0
12255	do	F. W. Bolgiano & Co., Washington, D. C.	E. P. Carter Co., Washington, N. C.	82.5
12453	do	Robert Buist Co., Philadelphia, Pa.	R. E. L. Cook, Tarboro, N. C.	85.0
12456	do	do	do	93.0
12534	do	do	Davis & Wolfe, Charlotte, N. C.	57.5
12343	do	do	W. A. Hayes, Hillsboro, N. C.	81.0
12344	do	do	do	21.5
12347	do	do	do	41.5
12041	do	do	J. H. Monger, Sanford, N. C.	95.0
12283	do	do	I. W. West, Mount Airy, N. C.	41.0
12284	do	do	do	51.5
12256	do	do	do	28.0
12263	do	E. B. Clark Seed Co., Milford, Conn.	Garden Drug Store Co., Greensboro, N. C.	63.0
12149	do	do	W. J. Kirkman & Co., Wilmington, N. C.	98.0
12150	do	do	do	22.0
12285	do	Crosman Bros. Co., Rochester, N. Y.	W. P. Ware, Reidsville, N. C.	56.5
12298	do	Diggs & Beadles, Richmond, Va.	J. B. Johnston, Greenville, N. C.	39.0
12300	do	do	do	96.0
12599	do	D. M. Ferry & Co., Detroit, Mich.	W. A. Ross & Sons, Morganton, N. C.	82.5
12443	do	Griffith & Turner, Baltimore, Md.	Burroughs-Pittman-Wheeler Co., Scotland Neck, N. C.	38.5

12384	do	Lake Shore Seed Co., Dunkirk, N. Y.	Gilsonville Drug Co., Gibsonville, N. C.	8.5
12510	do	do	W. J. Hodges, Williamston, N. C.	5.0
12455	do	D. Landreth Seed Co., Bristol, Pa.	E. Clark, Weldon, N. C.	37.5
12294	do	do	T. P. Cobb, Wilson, N. C.	90.0
12297	do	do	J. D. Daniels, Goldsboro, N. C.	97.0
12600	do	do	Freeze Drug Co., Newton, N. C.	98.5
12342	do	do	Graham Drug Co., Graham, N. C.	9.5
12668	do	do	Grant's Pharmacy, Asheville, N. C.	17.0
12669	do	do	do	78.0
12043	do	do	J. H. Monger, Sanford, N. C.	72.0
12143	do	do	J. E. Welch, High Point, N. C.	81.0
12145	do	do	do	68.0
12535	do	Leonard Seed Co., Chicago, Ill.	Charlotte Drug Co., Charlotte, N. C.	48.0
12275	do	do	Covington-Rodgers Drug Co., Durham, N. C.	34.5
12538	do	do	W. L. Hand & Co., Charlotte, N. C.	43.0
12539	do	do	do	30.0
12540	do	do	do	93.0
12290	do	do	J. E. Hood & Co., Kinston, N. C.	86.0
12292	do	do	Jeffreys & Sons, Goldsboro, N. C.	18.0
12670	do	do	Justus Pharmacy, Hendersonville, N. C.	18.0
12291	do	do	Ruffin-High Co., Wilson, N. C.	95.0
12578	do	Jerome B. Rice Seed Co., Cambridge, N. Y.	S. J. Adams, Raleigh, N. C.	97.5
12577	do	do	do	98.5
12537	do	do	Charlotte Drug Co., Charlotte, N. C.	57.5
12136	do	do	Durham Seed House, Durham, N. C.	98.0
12565	do	do	do	92.0
12352	do	do	J. H. Harding, Wilmington, N. C.	26.0
12151	do	do	do	1.0
12256	do	do	do	69.0
12140	do	do	do	93.5
12135	do	do	Haywood & Boone, Durham, N. C.	88.5
12044	do	do	A. S. Huske, Fayetteville, N. C.	0.0
12045	do	do	do	76.0
12296	do	do	W. P. Kornegay, Mount Olive	39.5
12495	do	do	Palace Drug Co., Goldsboro, N. C.	32.0
12656	do	do	W. W. Parker, Henderson, N. C.	99.0
12452	do	do	do	91.0
12269	do	do	Scott Seed Co., Greensboro, N. C.	5.5
12270	do	do	do	92.5

TABLE VI.—RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS, 667 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12273	PEAS	Jerome B. Rice Seed Co., Cambridge, N. Y.	Scott Seed Co., Greensboro, N. C.	4.5
12272	do.	do.	do.	3.5
12299	do.	do.	W. H. Tillman, Mount Olive, N. C.	45.0
12142	do.	do.	W. S. White & Co., Elizabeth City, N. C.	95.0
12147	do.	do.	do.	100.0
12543	do.	Slate Seed Co., South Boston, Va.	Fox & Lyon, Wadesboro, N. C.	91.5
12546	do.	do.	do.	88.5
12046	do.	do.	D. H. Grantham, Dunn, N. C.	97.0
12040	do.	do.	Grantham Bros., Lumberton, N. C.	98.0
12141	do.	George Tuit & Sons, Norfolk, Va.	I. C. Privott, Edenton, N. C.	99.0
12146	do.	Williams Seed Co., Norfolk, Va.	T. P. Nash, Elizabeth City, N. C.	95.0
12253	do.	do.	do.	94.0
12454	do.	T. W. Wood & Sons, Richmond, Va.	C. C. Adams, Salisbury, N. C.	95.5
12579	do.	do.	S. J. Adams, Raleigh, N. C.	95.0
12042	do.	do.	G. W. Baggett, Chadbourne, N. C.	77.5
12048	do.	do.	J. W. Carter Co., Maxton, N. C.	67.0
12598	do.	do.	Clarence Clapp, Newton, N. C.	6.5
12544	do.	do.	E. N. Covington & Co., Rockingham, N. C.	92.5
12259	do.	do.	Walter Credle & Co., Washington, N. C.	86.5
12149	do.	do.	Ferguson Drug Co., Halifax, N. C.	94.0
12451	do.	do.	do.	75.0
12346	do.	do.	Freeman Drug Co., Burlington, N. C.	10.3
12450	do.	do.	L. P. Hicks, Louisburg, N. C.	63.0
12144	do.	do.	Charles L. Johnson, Warsaw, N. C.	95.5
12257	do.	do.	R. M. Lee & Co., Edenton, N. C.	98.0
12348	do.	do.	W. J. Nicks, Graham, N. C.	46.0
12352	do.	do.	J. B. Smith Co., Lexington, N. C.	32.0
12254	do.	do.	W. R. Sprinkle, Beaufort, N. C.	90.0
12271	do.	do.	Tucker & Erwin, Greensboro, N. C.	89.0

12218	do	J. T. Turner, Ashboro, N. C.	38.5
12541	do	Watson-King Co., Rockingham, N. C.	93.0
12047	do	Brown Mercantile Co., Chadbourne, N. C.	91.0
12545	do	English Drug Co., Monroe, N. C.	98.5
12542	do	do	96.0
12621	do	Henry E. Kendall, Shelby, N. C.	63.0
12645	do	Linberger Seed Co., Gastonia, N. C.	60.5
12536	do	Love Bros. & Co., Kannapolis, N. C.	95.5
12432	do	Moore Bros., Thomasville, N. C.	58.0
12345	do	J. M. Tisdale, Burlington, N. C.	96.0
12514	do	D. M. Campbell, Halifax, N. C.	40.0
12419	do	T. P. Cobb, Wilson, N. C.	51.0
12493	do	W. T. Parker & Co., Weldon, N. C.	53.0
12056	do	Rice & Faeson, Hamlet, N. C.	63.5
12201	do	W. S. Blanchard & Son, Hertford, N. C.	95.0
12482	do	E. S. Bowers, Jackson, N. C.	97.5
12409	do	C. Call, North Wilkesboro, N. C.	99.5
12189	do	A. J. Cox & Co., Washington, N. C.	55.0
12473	do	L. P. Hicks, Louisburg, N. C.	80.5
12686	do	Macipe-Breggin Drug Co., Brevard, N. C.	67.0
12182	do	Mitcher's Pharmacy, Edenton, N. C.	93.5
12498	do	G. L. Robertson & Co., Robersonville, N. C.	88.5
12170	do	W. R. Sprinkler, Beaufort, N. C.	68.5
12358	do	J. T. Turner, Ashboro, N. C.	98.5
12198	do	T. E. White, Edenton, N. C.	94.0
12197	do	do	88.5
12506	do	E. T. Whitehead Co., Scotland Neck, N. C.	61.0
12553	do	T. M. Bynum, Goldston, N. C.	88.0
12679	do	Coburn & Wiggins, Robbinsville, N. C.	91.5
12194	do	Davis Bros., Columbia, N. C.	87.5
12503	do	J. B. Gilliam, Windsor, N. C.	91.5
12173	do	B. C. Jones, South Mills, N. C.	92.5
12689	do	E. B. King, Topton, N. C.	95.5
12370	do	Miles-Nelson-Ray Co., Mebane, N. C.	84.0
12583	do	Moore Bros. & Co., Roxboro, N. C.	98.0
12102	do	McDonald Hardware Co., McDonald, N. C.	89.0
12210	do	Mount Gilead Store Co., Mount Gilead, N. C.	87.0
12421	do	Parker & Newton, Farmville, N. C.	94.0
12672	do	G. W. Revis, Barkers Creek, N. C.	91.5

TABLE VI.—RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS, 667 SAMPLES IN ALL, COLLECTED BY INSPECTORS FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12555	RADISH	D. M. Ferry & Co., Detroit, Mich.	L. T. Thompson, Aurora, N. C.	92.0
12415	do.	do.	I. W. West, Mount Airy, N. C.	78.0
12164	do.	do.	Wrenn Bros. Co., Siler City, N. C.	88.5
12479	do.	Griffith & Turner, Baltimore, Md.	Burroughs-Pittman-Wheeler Co., Scotland Neck, N. C.	97.0
12386	do.	Lake Shore Seed Co., Dunkirk, N. Y.	Gibsonville Drug Co., Gibsonville, N. C.	94.0
12082	do.	D. Landreth Seed Co., Bristol, Pa.	J. T. Fields, Louisburg, N. C.	67.5
12207	do.	do.	W. S. White & Co., Elizabeth City, N. C.	91.5
12222	do.	Scott Seed Co., Greensboro, N. C.	Scott Seed Co., Greensboro, N. C.	93.0
12438	do.	George Tait & Sons, Norfolk, Va.	W. M. Matthews, Drum Hill, N. C.	98.5
12187	do.	T. W. Wood & Sons, Richmond, Va.	P. O. Leggett, Southport, N. C.	90.5
12241	do.	do.	Tucker & Erwin, Greensboro, N. C.	75.0
12245	do.	do.	do.	92.5
12561	do.	do.	Watson-King Co., Rockingham, N. C.	93.0
12442	RHUBARB	D. M. Ferry & Co., Detroit, Mich.	White & Shaffner, Climax, N. C.	74.0
12105	RUTABAGA	Crosman Bros. Co., Rochester, N. Y.	R. L. Anthony, Louisburg, N. C.	2.5
12204	do.	do.	W. S. Blanchard & Son, Hertford, N. C.	15.5
12480	do.	do.	E. S. Bowers, Jackson, N. C.	22.5
12408	do.	do.	C. Call, North Wilkesboro, N. C.	10.0
12474	do.	do.	L. P. Hicks, Louisburg, N. C.	63.0
12234	do.	do.	L. W. Lineberry, Randleman, N. C.	12.3
12251	do.	do.	Troy Cate, Troy, N. C.	16.0
12054	SQUASH	American Seed Co., Detroit, Mich.	Rice & Faeson, Hamlet, N. C.	80.0
12410	do.	Crosman Bros. Co., Rochester, N. Y.	C. Call, North Wilkesboro, N. C.	86.0
12049	do.	do.	W. L. London & Sons, Pittsboro, N. C.	10.0
12087	do.	D. M. Ferry & Co., Detroit, Mich.	Evington Drug Co., Louisburg, N. C.	92.0
12623	do.	do.	Fortune & King, Forest City, N. C.	69.0
12628	do.	do.	Fox & Kelly, Lenoir, N. C.	94.0
12652	do.	do.	Marrow-Freeman Co., Norwood, N. C.	40.5
12581	do.	do.	Moore Bros. & Co., Roxboro, N. C.	93.0

12152	do.	Lake Shore Seed Co., Dunkirk, N. Y.	McPherson & Co., Liberty, N. C.	74.0
12550	do.	do.	Watson-King Co., Rockingham, N. C.	82.0
12411	do.	do.	I. W. West, Mount Airy, N. C.	78.0
12163	do.	do.	Wrenn Bros. Co., Siler City, N. C.	69.0
12093	do.	Lake Shore Seed Co., Dunkirk, N. Y.	King Grocery Co., Lumberton, N. C.	24.0
12374	do.	D. Landreth Seed Co., Bristol, Pa.	Freeman Drug Co., Burlington, N. C.	74.0
12562	do.	T. W. Wood & Sons, Richmond, Va.	Watson-King Co., Rockingham, N. C.	88.0
12447	do.	Wood, Stubbs & Co., Louisville, Ky.	Moore Bros. Co., Thomasville, N. C.	87.0
12216	do.	American Seedtape Co., New York, N. Y.	Garden Drug Store Co., Greensboro, N. C.	90.0
12215	do.	do.	do.	86.0
12009	do.	Robert Buist Co., Philadelphia, Pa.	L. H. Caldwell, Lumberton, N. C.	81.5
12106	do.	Crosman Bros. Co., Rochester, N. Y.	R. L. Anthony, Louisburg, N. C.	97.5
12079	do.	do.	Brown Mercantile Co., Chadbourn, N. C.	91.0
12236	do.	do.	L. W. Lineberry, Randleman, N. C.	95.5
12183	do.	do.	Mitcher's Pharmacy, Edenton, N. C.	93.0
12074	do.	do.	Sanford Supply Co., Sanford, N. C.	81.0
12250	do.	do.	Troy Cafe, Troy, N. C.	80.0
12437	do.	D. M. Ferry & Co., Detroit, Mich.	Alfred & Goret, Climax, N. C.	83.0
12554	do.	do.	T. M. Bynum, Goldston, N. C.	78.0
12395	do.	do.	C. Call, North Wilkesboro, N. C.	89.5
12067	do.	do.	D. W. Fort, Roseboro, N. C.	Mislad
12622	do.	do.	Fortune & King, Forest City, N. C.	95.5
12379	do.	do.	Joseph A. Isley & Bros. Co., Burlington, N. C.	91.0
12654	do.	do.	Marrow-Freeman Co., Norwood, N. C.	78.5
12585	do.	do.	Moore Bros. & Co., Roxboro, N. C.	89.5
12101	do.	do.	McDonald Hardware Co., McDonald, N. C.	86.0
12212	do.	do.	Mount Gilead Store Co., Mount Gilead, N. C.	91.0
12387	do.	do.	W. J. Swanson, Pilot Mountain, N. C.	93.0
12231	do.	do.	Nance Thominson, Troy, N. C.	80.5
12551	do.	do.	Watson-King Co., Rockingham, N. C.	87.0
12383	do.	Lake Shore Seed Co., Dunkirk, N. Y.	Gibsonville Drug Co., Gibsonville, N. C.	85.5
12083	do.	D. Landreth Seed Co., Bristol, Pa.	J. T. Fields, Louisburg, N. C.	71.0
12376	do.	do.	Freeman Drug Co., Burlington, N. C.	78.5
12603	do.	do.	Freeze Drug Co., Newton, N. C.	63.5
12208	do.	do.	W. S. White & Co., Elizabeth City, N. C.	66.0
12225	do.	Scott Seed Co., Greensboro, N. C.	Scott Seed Co., Greensboro, N. C.	83.0
12485	do.	George Tait & Sons, Norfolk, Va.	W. M. Matthews, Drum Hill, N. C.	93.0
12185	do.	T. W. Wood & Sons, Richmond, Va.	P. O. Leggett, Southport, N. C.	90.5
12246	do.	do.	Tucker & Erwin, Greensboro, N. C.	86.0

TABLE VI.—RESULTS OF GERMINATION TESTS OF 24 KINDS OF VEGETABLE SEEDS, 667 SAMPLES IN ALL, COLLECTED BY INSPECTORS
FROM JULY 15, 1916, TO JULY 15, 1917—CONTINUED.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Per Cent of Germination
12221	TOMATOES	T. W. Wood & Sons, Richmond, Va.	J. T. Turner, Asheboro, N. C.	87.5
12558	do.	do.	Watson-King Co., Rockingham, N. C.	94.0
12445	do.	Wood, Stubbs & Co., Louisville, Ky.	Moore Bros, Thomasville, N. C.	89.5
12491	TURNIPS	American Seed Co., Detroit, Mich.	Burroughs Grocery Co., Warrenton, N. C.	68.5
12515	do.	do.	D. M. Campbell, Halifax, N. C.	84.5
12416	do.	do.	T. P. Cobb, Wilson, N. C.	85.5
12057	do.	do.	Rice & Faison, Hamlet, N. C.	84.5
12213	do.	American Seedcapi Co., New York, N. Y.	Garden Drug Store Co., Greensboro, N. C.	94.0
12098	do.	Robert Buist Co., Philadelphia, Pa.	L. H. Caldwell, Lumberton, N. C.	86.0
12191	do.	Crosman Bros. Co., Rochester, N. Y.	A. J. Cox & Co., Washington, N. C.	60.5
12684	do.	do.	Macipe-Breggin Drug Co., Brevard, N. C.	29.5
12247	do.	do.	Troy Cafe, Troy, N. C.	83.0
12200	do.	do.	T. E. White, Edenton, N. C.	80.0
12565	do.	do.	E. T. Whitehead Co., Scotland Neck, N. C.	29.0
12435	do.	D. M. Ferry & Co., Detroit, Mich.	Allred & Gowett, Climax, N. C.	88.5
12397	do.	do.	C. Call, North Wilkesboro, N. C.	78.0
12677	do.	do.	D. K. Collins, Cherokee, N. C.	80.5
12157	do.	do.	C. R. Curtis, Liberty, N. C.	93.0
12196	do.	do.	Davis Bros., Columbia, N. C.	84.0
12089	do.	do.	Evington Drug Co., Louisburg, N. C.	88.5
12068	do.	do.	D. W. Fort, Roseboro, N. C.	35.5
12025	do.	do.	Fortune & King, Forest City, N. C.	84.5
12504	do.	do.	J. B. Gilliam, Windsor, N. C.	88.0
12365	do.	do.	Hayes Drug Co., Graham, N. C.	74.5
12378	do.	do.	Joseph A. Isley & Co., Burlington, N. C.	79.0
12175	do.	do.	B. C. Jones, South Mills, N. C.	69.0
12426	do.	do.	M. S. Merritt & Co., Clinton, N. C.	82.0
12367	do.	do.	Miles-Nelson-Ray Co., Mebane, N. C.	64.5
12584	do.	do.	Moore Bros. & Co., Roxboro, N. C.	74.0

12100	do	McDonald Hardware Co., McDonald, N. C.	94.5
12155	do	McPherson & Co., Liberty, N. C.	83.5
12673	do	G. W. Revis, Barkers Creek, N. C.	71.5
12608	do	W. A. Ross & Sons, Morganton, N. C.	84.0
12649	do	C. C. Sanford Sons' Co., Mocksville, N. C.	91.5
12390	do	W. J. Swanson, Pilot Mountain, N. C.	91.5
12356	do	L. T. Thompson, Aurora, N. C.	90.5
12549	do	Watson-King Co., Rockingham, N. C.	77.5
12439	do	White & Shaffner, Climax, N. C.	87.5
12166	do	Wrenn Bros. Co., Siler City, N. C.	77.0
12507	do	W. J. Hodges, Williamston, N. C.	23.0
12242	do	Tucker & Erwin, Greensboro, N. C.	63.5
12444	do	Moore Bros., Thomasville, N. C.	94.0
12058	do	Rice & Faeson, Hamlet, N. C.	60.0
12050	do	W. L. London & Sons, Pittsboro, N. C.	48.0
12361	do	J. T. Turner, Asheboro, N. C.	90.0
12557	do	T. M. Bynum, Goldston, N. C.	10.0
12160	do	C. R. Curtis, Liberty, N. C.	19.0
12366	do	Hayes Drug Co., Graham, N. C.	58.0
12156	do	McPherson & Co., Liberty, N. C.	74.0
12075	do	A. S. Huske, Fayetteville, N. C.	16.0
12301	do	Palace Drug Co., Goldsboro, N. C.	77.0
12302	do	do	67.0
12237	do	Tucker & Erwin, Greensboro, N. C.	5.0
12026	do	Pace Grocery Co., Maxton, N. C.	80.5

TABLE VII.

SHOWING NUMBER AND AVERAGE PER CENT OF GERMINATION OF VEGETABLE SEED SAMPLES
TESTED, ACCORDING TO WHOLESALE DEALERS.

Wholesale Dealer	Number of Samples Tested	Average Per Cent of Germination
American Seed Co., Detroit, Mich.....	21	71.97
American Seedtape Co., New York, N. Y.....	4	80.25
W. W. Barnard Co., Chicago, Ill.....	12	77.54
J. Bolgiano & Son, Baltimore, Md.....	1	97.00
F. W. Bolgiano & Co., Washington, D. C.....	1	82.50
Robert Buist Co., Philadelphia, Pa.....	44	80.02
William D. Burt, Dalton, N. Y.....	4	66.87
Everett B. Clark Seed Co., Milford, Conn.....	8	73.00
Crosman Bros. Co., Rochester, N. Y.....	84	61.06
Diggs & Beadles, Richmond, Va.....	10	80.86
D. M. Ferry & Co., Detroit, Mich.....	169	76.26
W. G. Grandy, Elizabeth City, N. C.....	1	98.50
Griffith & Turner, Baltimore, Md.....	6	67.66
Hall Seed Co., Louisville, Ky.....	1	95.50
Kirby Seed Co., Gaffney, S. C.....	1	77.00
Lake Shore Seed Co., Dunkirk, N. Y.....	14	36.96
D. Landreth Seed Co., Bristol, Pa.....	55	73.95
Leonard Seed Co., Chicago, Ill.....	29	73.15
Jerome B. Rice Seed Co., Cambridge, N. Y.....	42	78.77
Scott Seed Co., Greensboro, N. C.....	5	80.80
Slate Seed Co., South Boston, Va.....	14	83.17
George Tait & Sons, Inc., Norfolk, Va.....	6	91.25
H. Van Buskirk, Rocky Ford, Colo.....	1	96.50
Williams Seed Co., Norfolk, Va.....	2	94.50
Wood, Stubbs & Co., Louisville, Ky.....	48	89.97
T. W. Wood & Sons, Richmond, Va.....	79	77.82
Dealer not given.....	5	71.20

TABLE VIII.—THE ADULTERATION OF AGRICULTURAL SEEDS.

Laboratory Number	Kind of Seed	Wholesale Dealer	Retail Dealer	Adulterant	Per Cent of Adulteration
8166	BLUE GRASS, KENTUCKY	National Seed Co., Louisville, Ky.	W. E. Merritt Co., Mount Airy, N. C.	Timothy	11
8482	do	Wood, Stubbs & Co., Louisville, Ky.	Paul Webb, Shelby, N. C.	Redtop	17
8482	do	do	do	Perennial Rye Grass	15
7909	CLOVER, RED	T. W. Wood & Sons, Richmond, Va.	Byers Brothers, Hendersonville, N. C.	Crimson Clover	9
8461	GRASS, ORCHARD	Louisville Seed Co., Louisville, Ky.	L. A. Kincaid, Morganton, N. C.	Meadow Fescue	10
8309	OATS	T. W. Wood & Sons, Richmond, Va.	M. O. Blount & Sons, Bethel, N. C.	Barley	13
8231	REDTOP	N. R. Savage & Son, Richmond, Va.	W. H. Reid, Pilot Mountain, N. C.	Timothy	8
8445	do	T. W. Wood & Sons, Richmond, Va.	W. A. Myatt, Raleigh, N. C.	do	13
8709	RYE	N. R. Savage & Son, Richmond, Va.	Edwards & Co., Scotland Neck, N. C.	Wheat	11
8125	TIMOTHY	T. W. Wood & Sons, Richmond, Va.	Beeson Hardware Co., High Point, N. C.	Redtop	12

NOTE.—The above table shows 9 cases of adulteration which were found in the 686 agricultural seed samples collected by inspectors. No case is reported where an adulterant was not present to the amount of five (5) per cent.

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DEPARTMENT OF AGRICULTURE
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I. ANALYSES OF FERTILIZERS } FALL SEASON, 1916
 } SPRING SEASON, 1917

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LETTER OF TRANSMITTAL

HON W. A. GRAHAM,
Commissioner of Agriculture.

SIR:—I submit herewith analyses of fertilizers made in the laboratory of samples collected during the past fall and spring. These analyses show fertilizers and meals to be about as heretofore, and to be, generally, what was claimed for them. I recommend that it be issued as the October BULLETIN.

Very respectfully,

B. W. KILGORE,
State Chemist.

Approved for printing:

W. A. GRAHAM,
Commissioner.

ANALYSES OF FERTILIZERS

FALL SEASON, 1916; SPRING SEASON, 1917

BY B. W. KILGORE,

W. G. HAYWOOD, J. Q. JACKSON, E. S. DEWAR, T. G. HILL, AND B. B. BRANDT.

The analyses presented in this BULLETIN are of samples collected by the fertilizer inspectors of the Department, under the direction of the Commissioner of Agriculture, during fall months of 1916 and the spring months of 1917. They should receive the careful study of every farmer in the State who uses fertilizers, as by comparing the analyses in the BULLETIN with the claims made for the fertilizers actually used, the farmer can know by or before the time fertilizers are put in the ground whether or not they contain the fertilizing constituents in the amounts they were claimed to be present.

TERMS USED IN ANALYSES

Water-soluble Phosphoric Acid.—Phosphate Rock, as dug from the mines, mainly in South Carolina, Florida, and Tennessee, is the chief source of phosphoric acid in fertilizers.

In its raw, or natural, state the phosphate has three parts of lime united to the phosphoric acid (called by chemists tricalcium phosphate). This is very insoluble in water and is not in condition to be taken up readily by plants. In order to render it soluble in water and fit for plant food, the rock is finely ground and treated with sulphuric acid, which acts upon it in such a way as to take from the three-lime phosphate two parts of its lime, thus leaving only one part of the lime united to the phosphoric acid. This one-lime phosphate is what is known as water-soluble phosphoric acid.

Reverted Phosphoric Acid.—On long standing some of this water-soluble phosphoric acid has a tendency to take lime from other substances in contact with it, and to become somewhat less soluble. This latter is known as reverted or gone-back phosphoric acid. This is thought to contain two parts of lime in combination with the phosphoric acid, and is thus an intermediate product between water-soluble and the original rock.

Water-soluble phosphoric acid is considered somewhat more valuable than reverted, because it becomes better distributed in the soil as a consequence of its solubility in water.

Available Phosphoric Acid is made up of the water-soluble and reverted; it is the sum of these two.

Water-soluble Ammonia.—The main materials furnishing ammonia in fertilizers are nitrate of soda, sulphate of ammonia, cotton-seed meal, dried blood, tankage, and fish scrap. The first two of these (nitrate of soda and sulphate of ammonia) are easily soluble in water and become well distributed in the soil where plant roots can get at them. They are, especially the nitrate of soda, ready to be taken up by plants, and are therefore quick-acting forms of ammonia. It is mainly the ammonia from nitrate of soda and sulphate of ammonia that will be designated under the heading of water-soluble ammonia.

Organic Ammonia.—The ammonia in cotton-seed meal, dried blood, tankage, fish scrap, and so on, is included under this heading. These materials are insoluble in water, and before they can feed plants they must decay and have their ammonia changed, by the aid of the bacteria of the soil, to nitrates, similar to nitrate of soda.

They are valuable then as plant food in proportion to their content of ammonia, and the rapidity with which they decay in the soil, or rather the rate of decay will determine the quickness of their action as fertilizers. With short season, quickgrowing crops, quickness of action is an important consideration, but with crops occupying the land during the greater portion, or all, of the growing season, it is better to have a fertilizer that will become available more slowly, so as to feed the plant till maturity. Cotton-seed meal and dried blood decompose fairly rapidly, but will last the greater portion, if not all, of the growing season in this State. While cotton seed and tankage will last longer than meal and blood, none of these act so quickly, or give out so soon, as nitrate of soda and sulphate of ammonia.

Total Ammonia is made up of the water-soluble and organic; it is the sum of these two.

The farmer should suit, as far as possible, the kind of ammonia to his different crops, and a study of the forms of ammonia as given in the tables of analyses will help him to do this.

AVAILABILITY OF NITROGEN

During the past few years the increasing cost and the extensive use for other purposes of the standard high-grade ammoniates have caused the appearance upon the market of many new nitrogenous materials which are being used as sources of nitrogen in commercial fertilizers. These materials are, to a large extent, trade-waste products, in themselves not permissible as sources of nitrogen, but which after treatment in various ways develop a considerable degree of availability, and in many cases the nitrogen contained therein becomes very largely water-soluble.

On account of the extensive use of these new ammoniates this department is now making in its laboratory by chemical methods determina-

tions of the availability of the water-insoluble organic nitrogen in the samples of fertilizers taken for analysis. In this way we are largely able to differentiate between the good and the bad ammoniates and to distinguish those forms which are readily available from those more difficultly so.

VALUATIONS

To have a basis for comparing the values of different fertilizer materials and fertilizers, it is necessary to assign prices to the three valuable constituents of fertilizers—ammonia, phosphoric acid, and potash. These figures, expressing relative value per ton, are not intended to represent crop-producing power, or agricultural value, but are estimates of the commercial value of ammonia, phosphoric acid and potash in the materials supplying them. These values are only approximate, as the cost of fertilizing materials is liable to change, as other commercial products are, but they are believed to fairly represent the cost of making and putting fertilizers on the market. They are based on a careful examination of trade conditions, wholesale and retail, and upon quotations of manufacture.

Relative value per ton, or the figures showing this, represent the prices on board the cars at the factory, in retail lots of five tons or less, for cash.

To make a complete fertilizer the factories have to mix together in proper proportions materials containing ammonia, phosphoric acid, and potash. This costs something. For this reason it is thought well to have two sets of valuations—one for the raw or unmixed materials, such as acid phosphate, kainit, cotton-seed meal, etc., and one for mixed fertilizers.

VALUATIONS FOR 1917

In Unmixed or Raw Materials

For phosphoric acid in acid phosphate.....	4½	cents per pound
For phosphoric acid in bone meal and Peruvian Guano	4	cents per pound
For nitrogen	20	cents per pound

In Mixed Fertilizers

For phosphoric acid	5	cents per pound
For nitrogen	21	cents per pound
For potash	25	cents per pound

HOW RELATIVE VALUE IS CALCULATED

In the calculation of relative value it is only necessary to remember that so many per cent means the same number of pounds per hundred, and that there are twenty hundred pounds in one ton (2,000 pounds).

With an 8-2-1.65 goods, which means that the fertilizer contains available phosphoric acid 8 per cent, potash 2 per cent, and nitrogen 1.65 per cent, the calculation is made as follows:

<i>Percentage or Lbs. in 100 Lbs.</i>		<i>Value per 100 Lbs.</i>	<i>Value per Ton, 2,000 Lbs.</i>
8	pounds available phosphoric acid at 5 cents	0.40 $\times 20$	\$ 8.00
1.65	pounds nitrogen at 21 cents.....	0.3465 $\times 20$	6.93
2	pounds potash at 25 cents.....	0.50 $\times 20$	10.00
Total value		1.2465 $\times 20$	\$ 24.93

Freight and merchant's commission must be added to these prices.

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1916. MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Acid Phosphoric	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brands claiming			8.00	-----	-----	1.65	2.00	2.00	\$24.93
106	American Agricultural Chemical Co., New York, N. Y.	Grain and Grass Compound	Elkin	8.88	.87	.66	1.53	1.86	1.73	23.96
114	American Fertilizing Co., Norfolk, Va.	Bone and Peruvian Guano	Asheboro	9.34	.51	.72	1.23	1.50	2.44	26.71
68	Armour Fertilizer Works, Greensboro, N. C.	Armour's Slaughter House for Grain Fertilizer.	Lenoir	9.39	.23	.64	.87	1.06	1.82	22.14
158	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Double Plant Food	Tabor	8.05	.91	.84	1.75	2.13	2.19	26.35
81	-----do-----	Baugh's Wheat Fertilizer for Wheat and Grass.	Greensboro	8.41	1.11	.86	1.97	2.40	2.48	29.08
137	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 8-2-2 Standard Grade Guano	Statesville	7.72	.93	.82	1.75	2.13	2.05	25.32
171	Columbia Guano Co., Norfolk, Va.	Columbia Soluble Guano	Rutherfordton	8.49	.99	.60	1.59	1.93	2.04	25.37
62	Cooperative Warehouse Co., Salisbury, N. C.	Farmers' Union 8-2-2 Guano	Lincolnton	7.84	.63	.92	1.55	1.88	2.21	25.40
65	-----do-----	do.	Newton	7.34	.66	.76	1.42	1.73	1.66	21.60
131	Georgia Chemical Works, Augusta, Ga.	Georgia Formula	No. Wilkesboro	8.55	.59	.84	1.43	1.74	1.38	21.46
99	Imperial Company (The), Norfolk, Va.	Imperial Standard Premium Guano	Ruffin	8.22	1.21	.58	1.79	2.18	1.97	25.59
112	Old Buck Guano Co., Richmond, Va.	Old Buck Warsaw	Asheboro	8.39	1.03	.68	1.71	2.08	1.98	25.47
178	Rasin-Monumental Co., Baltimore, Md.	Rasin's Empire Guano	Lawndale	9.03	1.09	.54	1.63	1.98	1.72	24.48
129	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Farmers' Bone Fertilizer for Tobacco.	Elkin	8.29	.89	.70	1.59	1.93	1.97	24.82
174	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Red Steer Standard Grade Guano	Cliffside	9.08	1.71	.88	1.59	1.93	1.93	25.41
156	-----do-----	do.	Bryson City	9.15	.09	1.40	1.49	1.81	1.72	24.01

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1916.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory	
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		Total Potash
Brands claiming										
45	Tidewater Guano Co., Norfolk, Va.	Double Action Soluble Guano.	Taylorsville.	8.00	1.31	.30	1.65	2.00	2.00	\$24.93
91	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Standard for Grain.	Biltmore.	7.48	.23	.26	.49	.60	1.61	19.87
43	Union Guano Co., Winston-Salem, N. C.	Fish Brand Ammoniated Guano.	Taylorsville.	9.76	1.03	.58	1.61	1.96	2.21	26.65
57	do.	Old Honesty Guano.	Cherryville.	8.84	1.17	.56	1.73	2.10	1.80	25.01
73	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittle's Owl Brand Guano.	Gibsonville.	8.74	1.25	.76	2.01	2.44	2.34	27.93
60	do.	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	Waco.	7.79	1.29	.46	1.75	2.13	2.08	26.69
88	do.	Eureka Ammoniated Bone.	Spruce Pine.	8.94	1.53	.36	1.89	2.30	2.79	30.99
125	do.	Soluble Guano.	Ramseur.	9.10	1.61	.36	1.97	2.40	2.85	30.42
154	do.	S. W. Travers & Co.'s Beef, Blood, and Bone Fertilizer.	Andrews.	7.90	1.51	.66	2.17	2.64	2.41	30.02
166	do.	V.-C. C. Co.'s Farmers' Favorite Fertilizer C. S. M.	Wallace.	8.86	.41	1.40	1.81	2.20	1.94	25.96
Brands claiming										
164	Va.-Car. Chemical Co., Richmond, Va.	Charlotte Oil and Fertilizer Co.'s Special 3% Guano C. S. M.	Wallace.	8.00	1.13	1.50	2.63	3.20	1.48	26.55
165	do.	V.-C. C. Co.'s 3% C. S. M. Guano.	Wallace.	8.10	1.03	1.42	2.45	2.98	1.92	28.48
162	do.	V.-C. C. Co.'s Gold Medal H. G. Tobacco Guano.	Chadbourn.	7.90	1.01	1.18	2.19	2.66	2.01	27.15
Brands claiming										
157	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Three Score Complete Fertilizer.	Tabor.	8.00	1.57	.88	2.47	3.00	3.00	33.37
				8.75	1.57	.88	2.45	2.98	3.06	34.36

169	Va.-Car. Chemical Co., Richmond, Va. Brand claiming -----	Norfolk and Carolina Chemical Co.'s Amazon H. G. Manure.	Mount Olive	8.74	.95	1.60	2.55	3.10	2.82	33.55
172	Navassa Guano Co., Wilmington, N. C. Brands claiming -----	Navassa Wheat Fertilizer	Forest City	11.98	.13	.60	.82	.89	2.23	20.30
132	Georgia Chemical Works, Augusta, Ga. Royster, F. S., Guano Co., Norfolk, Va.	Georgia Bell Compound Bison Special Fertilizer	No. Wilkesboro Cherryville	8.92	.45	.54	.99	1.20	1.64	21.28
58	Union Guano Co., Winston, N. C. Va.-Car. Chemical Co., Richmond, Va.	Carolina Grain Grower Allison & Addison's Little Giant Grain and Grass Grower.	Taylorsville Climax	9.96	.53	.40	.87	1.06	1.90	22.55
20	Brands claiming -----			9.16	.79	.24	1.03	1.25	1.94	23.19
110	Armour Fertilizer Works, Greensboro, N. C. Baugh & Sons Co., Norfolk, Va.	Armour's No. 9-2-1 for Grain Fertilizer Baugh's Bone and Potash Mixture	Asheboro Burlington	8.42	.67	1.04	1.71	2.08	1.50	23.10
6	Lister's Agricultural Chemical Works, Newark, N. J. do-----	Lister's Standard Pure Superphosphate Lister's Standard Superphosphate	Siler City Newton	9.16	1.25	.60	1.85	2.25	1.06	22.23
121	Old Buck Guano Co., Richmond, Va. Brands claiming -----	Old Buck Clark's Wheat Formula	Asheville	8.99	1.09	.50	1.59	1.93	.99	20.42
102	Rasin-Monumental Co., Baltimore, Md. Reidsville Fertilizer Co., Reidsville, N. C.	Baltimore Special Mixture Reidsville Big Crop Guano	Milton Mount Airy	9.98	.59	.50	1.09	1.33	1.61	22.61
104	Royster, F. S., Guano Co., Norfolk, Va. Swift & Co. Fertilizer Works, Atlanta, Ga.	Royster's Honey Bee Special Compound Swift's Cotton Plant	Catawba Hendersonville	8.82	1.21	.38	1.59	1.93	.85	19.75
37	Union Guano Co., Winston-Salem, N. C. Venable Fertilizer Co., Richmond, Va.	Q. and Q., Quality and Quantity Guano Venable's Bone Special	Waco Ruffin	9.52	1.01	.74	1.75	2.13	1.16	22.67
59	Va.-Car. Chemical Co., Richmond, Va. Brands claiming -----	Allison & Addison's Star Brand Guano	Clyde	10.02	1.21	.60	1.81	2.20	.93	22.27
100				9.05	.33	1.50	1.83	2.22	1.34	23.44
42				10.73	.79	.68	1.47	1.79	.98	21.80
25	Armour Fertilizer Works, Greensboro, N. C. Georgia Chemical Works, Augusta, Ga.	Armour's No. 1011 for Grain Georgia Special 10-1-1 Ammoniated Mix- ture.	Hendersonville Mount Airy	10.79	.47	.34	.81	.98	1.01	19.24
103	Imperial Company, Norfolk, Va.	Imperial 1-10-1 Fertilizer	Burlington	10.46	.15	.72	.87	1.06	.75	17.86
9				9.88	.47	.50	.97	1.18	1.11	19.50

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1916.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	
	Brands claiming			10.00			.82	1.00	\$18.44
175	Navassa Guano Co., Wilmington, N. C.	Navassa Wheat Belt Guano	Lawndale	11.74	.27	.42	.69	.84	.92 19.24
50	Patapsco Guano Co., Baltimore, Md.	Coon Brand Guano, 1916	Mooresville	10.32	.65	.30	.95	1.16	.94 19.01
89	Swift & Co. Fertilizer Works, Atlanta Ga.	Swift's Plow Boy Guano	Clyde	10.57	.09	1.14	1.23	1.50	1.39 22.69
	Brands claiming			10.00			.82	.75	2.00 22.60
109	Armour Fertilizer Works, Greensboro, N. C.	Armour's Grain Fertilizer	Asheboro	9.65	.27	.32	.59	.72	1.96 21.93
149	do.	do.	Kings Mountain	10.14	.27	.36	.63	.77	1.76 21.59
134	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Special Grain Fertilizer	Concord	10.24	.19	.44	.63	.77	2.02 22.99
	Brand claiming			10.00			.82	1.00	2.00 23.44
10	Imperial Company, Norfolk, Va.	Imperial 1-10-2 Fertilizer	Burlington	10.07	.43	.50	.93	1.13	1.97 23.83
	Brand claiming			5.00			4.11	5.00	22.30
167	Navassa Guano Co., Wilmington, N. C.	Carr's Fish Ammoniated Phosphate	Wallace	4.82	3.33	.42	3.75	4.56	20.57
	Brand claiming			8.00			1.65	2.00	14.93
16	Va.-Car. Chemical Co., Richmond, Va.	Mammoth Ammoniated Compound	Waynesville	10.75	1.29	.54	1.83	2.22	18.44
	Brands claiming			8.00			3.29	4.00	21.82
168	Acme Mfg. Co., Wilmington, N. C.	Acme 8-4-0 Special Fertilizer	Mount Olive	8.12	1.91	1.94	3.85	4.68	24.39
160	Va.-Car. Chemical Co., Richmond, Va.	V.-C. 8-4-0 Ammoniated Compound	Tabor	9.19	3.11	.20	3.31	4.02	23.09

Brands claiming.....		9.60	2.47	3.00	19.37
30	Armour Fertilizer Works, Greensboro, N. C.....				
161	Baugh & Sons Co., Philadelphia, Pa.	Norwood.....	1.25	1.00	18.15
75	Georgia Chemical Works, Augusta, Ga.....	Chadbourn.....	1.45	1.00	19.71
159	Va-Car. Chemical Co., Richmond, Va.....	Gibsonville.....	2.29	.28	22.28
		Tabor.....	1.53	.76	19.54
	Brands claiming.....				
170	Armour Fertilizer Works, Greensboro, N. C.....				
56	Berkley Chemical Co., Norfolk, Va.....	Shelby.....	.55	1.14	17.79
145	Georgia Chemical Works, Augusta, Ga.....	Monroe.....	.99	.56	16.86
28	Norfolk Fertilizing Co., Norfolk, Va.....	Lexington.....	.93	.42	16.07
118	Old Buck Guano Co., Richmond, Va.....	Mount Gilead.....	.91	.50	16.84
179	Powhatan Chemical Co., Richmond, Va.....	Siler City.....	.79	.72	17.03
87	Royster, F. S., Guano Co., Norfolk, Va.....	Lawndale.....	.11	1.66	16.43
80	Union Guano Co., Norfolk, Va.....	Burnsville.....	.89	.82	17.87
94	Va-Car. Chemical Co., Richmond, Va.....	Brown Summit.....	.95	.38	16.95
	Brands claiming.....	Greensboro.....	.91	.32	15.80
23	Acme Mfg. Co., Wilmington, N. C.....				
		Biscoe.....	.87	1.28	20.54
	Brands claiming.....				
176	Navassa Guano Co., Wilmington, N. C.....				
177	Union Guano Co., Winston-Salem, N. C.....	Lawndale.....	.53	.32	16.86
		Lawndale.....	.63	.46	15.65
5	Baugh & Sons Co., Norfolk, Va.....				
96	Ober, G., & Sons Co., Baltimore, Md.....				
120	Union Guano Co., Winston-Salem, N. C.....				
61	Swift & Co. Fertilizer Works, Atlanta, Ga.....				

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1916.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash Total	
	Brands claiming			9.00				3.00	\$24.00
77	Union Guano Co., Winston-Salem, N. C.	Union 9-3 Bone and Potash	Greensboro	9.33				3.27	25.73
1	do.....	do.....	Greensboro	8.34				3.10	23.84
	Brands claiming			10.00				2.00	20.00
140	American Fertilizing Co., Norfolk, Va.	Dissolved Bone and Potash for Corn and Wheat.	Hildebran	10.56				1.65	18.81
124	American Agricultural Chemical Co., New York, N. Y.	Alkaline Phosphate.	Ramseur	8.31				1.17	14.16
108	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 10-0-2 Bone and Potash Standard Grade.	Elkin	10.02				1.66	18.32
142	Swift and Co. Fertilizer Works, Atlanta, Ga.	Swift's Wheat Growers Standard Grade Phosphate Potash.	Mooresville	10.24				1.69	18.69
90	do.....	Swift's Wheat Grower Phosphate and Potash.	Clyde	10.15				1.58	18.05
49	Union Guano Co., Charlotte, N. C.	Birmingham Special Bone and Potash.	Mooresville	10.42				1.36	17.22
25	Union Guano Co., Winston, N. C.	Union Bone and Potash.	Troy	10.49				1.98	20.39
17	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Blue Ridge Wheat Grower.	Waynesville	9.52				1.58	17.42
40	do.....	Southern Chemical Co.'s Mammoth Wheat Grower.	Clyde	9.45				1.31	16.00
72	do.....	Travers & Co.'s Capital Fertilizer.	Durham	10.74				1.85	19.99
	Brand claiming			11.00				1.00	16.00
11	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s 11-1 Bone and Potash.	Burlington	13.37				.52	16.57

	Brands claiming.					
119	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers Union 12-0-2 Bone and Potash High Grade,	Siler City.....	-----	-----	-----
7	Imperial Co., Norfolk, Va.....	Imperial 12-2 Potash Mixture.....	Burlington.....	-----	-----	-----
	Brand claiming			-----	-----	-----
31	Brown, H. P., Guano Co., Salisbury, N. C	Brown's 14-0-2 Bone and Potash High Grad ^e .	Salisbury.....	-----	-----	-----
				-----	-----	-----

RAW OR UNMIXED FERTILIZER MATERIALS.

	Brand claiming.....					
92	Va.-Car. Chemical Co., Richmond, Va.....	Duham Fertilizer Co.'s Double Bone Phosphate Extra Strong.....	Hillsboro.....	15.66		14.09
	Brands claiming.....			14.00		12.60
139	American Fertilizing Co., Norfolk, Va.....	High Grade Acid Phosphate.....	Hildebran.....	15.38		13.84
69	Armour Fertilizer Works, Greensboro, N. C.....	Armour's Star Phosphate.....	Lenoir.....	12.31		11.08
95	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s 14% Acid Phosphate.....	Greensboro.....	15.23		13.71
	Brands claiming.....			16.00		14.00
24	Acme Manufacturing Co., Wilmington, N. C.....	16% Acid Phosphate.....	Biscoe.....	17.84		16.06
182	do.....	Car Load Bulk 16% Acid Phosphate.....	Fayetteville.....	16.93		15.24
123	American Agricultural Chemical Co., New York, N. Y.....	Superphosphate.....	Stanley.....	16.29		14.66
36	Armour Fertilizer Works, Greensboro, N. C.....	Armou's 16% Acid Phosphate.....	Hendersonville.....	16.88		15.19
39	Asheville Packing Co., Asheville, N. C.....	Asheville Packing Co.'s High Grade Phosphate.....	Asheville.....	16.37		14.73
113	Atlantic Chemical Co., Norfolk, Va.....	Girl Grade Dissolved Bone and Potash 16%.....	Asheboro.....	17.42		15.68
144	Atlantic Fertilizer Works, Wilmington, N. C.....	Atlantic Acid Phosphate 16% High Grade.....	Lexington.....	16.32		14.69
83	Baugh & Sons Co., Philadelphia, Pa.....	Baugh's 16% Acid Phosphate.....	Greensboro.....	17.86		16.07
55	Berkley Chemical Co., Norfolk, Va.....	Resolute Acid Phosphate.....	Monroe.....	17.05		15.34
122	Brown, II. P., Guano Co., Salisbury, N. C.....	Brown's 16% Acid Phosphate.....	Stanley.....	17.26		15.53
138	Brown, II. P., Guano Co., Salisbury, N. C.....	Brown's High Grade 16% Acid Phosphate.....	Statesville.....	16.71		15.04

ANALYSES OF COMMERCIAL FERTILIZERS—FALL SEASON, 1916.
RAW OR UNMIXED FERTILIZER MATERIALS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brands claiming.....			Available Phosphoric Acid					
127	Carolina Union Fertilizer Co., Norfolk, Va.....	Carolina Union 16% Acid Phosphate.....	Elkin.....	16.00					\$14.40
93	-----do.....	-----do.....	Hillsboro.....	16.91					15.25
151	Chickamauga Fertilizer Works, Chattanooga, Tenn.....	Chickamauga High Grade 16% Dissolved Bone.....	Murphy.....	16.60					14.94
150	Columbia Guano Co., Norfolk, Va.....	Columbia High Grade 16% Acid Phosphate.....	Kings Mountain.....	16.53					14.88
64	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers Union 16% Acid Phosphate.....	Gastonia.....	16.68					15.01
14	Farmers Fertilizer Works, Spartanburg, S. C.....	Red Rooster Acid Phosphate.....	Dillsboro.....	16.40					14.76
26	Farmers Guano Co., Raleigh, N. C.....	F. G. C. 16% Acid Phosphate.....	Mount Gilred.....	15.96					14.36
76	Georgia Chemical Works, Augusta, Ga.....	High Grade Dissolved Bone Phosphate.....	Gibsonville.....	17.40					15.66
8	Imperial, The Co., Norfolk, Va.....	Imperial High Grade Tennessee Acid Phosphate.....	Burlington.....	17.27					15.54
4	Navassa Guano Co., Wilmington, N. C.....	Navassa 16% Acid Phosphate.....	Graham.....	16.01					14.41
173	-----do.....	-----do.....	Forest City.....	17.46					15.71
27	Norfolk Fertilizing Co., Norfolk, Va.....	Oriana 16% Acid Phosphate.....	Mount Gilred.....	17.41					15.67
29	Old Buck Guano Co., Richmond, Va.....	Old Buck 16% Acid Phosphate.....	Norwood.....	17.39					15.65
148	Pamlico Chemical Co., Washington, N. C.....	Pamlico High Grade Acid Phosphate.....	Salisbury.....	16.47					14.82
67	Patapsco Guano Co., Baltimore, Md.....	Florida Soluble Phosphate.....	Hickory.....	16.98					15.28
54	Planters Fertilizer and Phosphate Co., Charleston, S. C.....	Planters 16% Acid Phosphate.....	Wadesboro.....	16.53					14.88
180	Powhatan Chemical Co., Richmond, Va.....	Magic Dissolved Bone.....	Lawndale.....	17.27					15.54
				16.83					15.15

141	Rasin-Monumental Co., Baltimore, Md.	Rasin's 16% Acid Phosphate.	Lincolnton.	17.50	15.75
63	.....do.....	do.	Lincolnton.	16.71	15.04
152	Read Phosphate Co., Nashville, Tenn.	Read's Special High Grade Acid Phosphate.	Murphy.	15.98	14.38
135	Richmond Guano Co., Richmond, Va.	Rex Dissolved Bone.	Concord.	17.04	15.34
133	Robertson Fertilizer Co., Norfolk, Va.	High Peak Acid Phosphate.	No. Wilkesboro.	16.10	14.49
85	Royster, F. S., Guano Co., Norfolk, Va.	Columbia High Grade 16% Acid Phosphate.	Toecane.	16.85	15.16
32	.....do.....	Royster's High Grade 16% Acid Phosphate.	Waynesville.	16.76	15.08
153	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special Acid Phosphate.	Murphy.	18.04	16.24
48	.....do.....	do.	Stony Point.	15.93	14.34
147	Tennessee Chemical Co., Greensboro, N. C.	Ox Tennessee High Grade Acid Phosphate.	Thomasville.	16.66	14.99
146	Tidewater Guano Co., Norfolk, Va.	Top Rail Acid Phosphate.	Lexington.	16.49	14.84
51	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid Phosphate.	Mocksville.	16.24	14.62
70	Union Guano Co., Winston-Salem, N. C.	Union 16% Acid Phosphate.	Lenoir.	17.30	15.53
126	Union Guano Co., Norfolk, Va.	do.	Elkin.	16.77	15.09
18	Va.-Car. Chemical Co., Richmond, Va.	Atlantic and Va. Fert. Co.'s Eureka.	Asheville.	16.31	14.68
155	.....do.....	Davie & Whittle's Owl Brand High Grade.	Andrews.	16.55	14.89
117	.....do.....	Southern Chemical Co.'s Comet 16% Acid Phosphate.	Pittsboro.	16.84	15.16
71	.....do.....	do.	Lenoir.	17.56	15.80
41	.....do.....	Travers & Co.'s Champion Acid Phosphate.	Clyde.	16.43	14.79
12	.....do.....	V.-C. C. Co.'s 16% Acid Phosphate.	Franklin.	17.17	15.45
128	.....do.....	Va. State Fertilizer Co.'s Bull Run Acid Phosphate.	Elkin.	16.77	15.09
101	Venable Fertilizer Co., Richmond, Va.	Venable Best Acid Phosphate.	Ruffin.	16.72	15.05

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory	
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash		
	Brands claiming.....			8.00				1.65	2.00	2.00	\$24.93
2839	Aeme Mfg. Co., Wilmington, N. C.....	Cotton-seed Meal Guano.....	Jamesville.....	7.91	.78	.88	2.02	1.66	2.02	2.06	25.18
392	American Agricultural Chemical Co., New York, N. Y.....	Detrick's Rival Tobacco Compound.....	Roxboro.....	8.00	.84	.66	1.82	1.50	1.82	1.75	23.05
379	.....do.....	Ellis Brand 8-2-2.....	Henderson.....	8.18	.82	.92	2.11	1.74	2.11	2.17	26.34
2304	.....do.....	Reese's Pacific Guano.....	Mebane.....	7.77	.90	.88	2.16	1.78	2.16	2.04	25.45
339	.....do.....	Rose Brand 8-2-2.....	Henderson.....	7.93	1.10	.76	2.26	1.86	2.26	2.66	29.04
336	.....do.....	Hot Stuff Vance.....	Henderson.....	7.99	.94	.74	2.04	1.68	2.04	2.29	26.50
340	.....do.....	Planter's Special 8-2-2.....	Henderson.....	7.72	1.08	.94	2.46	2.02	2.46	2.22	27.30
342	.....do.....	Zell's Special Compound for Tobacco.....	Creedmoor.....	8.52	1.10	.60	2.07	1.0	2.07	1.94	25.36
2275	.....do.....	.....do.....	Ahoskie.....	9.09	1.16	.48	1.99	1.64	1.99	1.80	24.98
2157	American Fertilizing Co., Nortolk, Va.....	Bone and Peruvian Guano.....	Dunn.....	8.90	1.38	.34	2.09	1.72	2.09	2.10	26.62
2468	.....do.....	.....do.....	Fayetteville.....	9.28	.64	.98	1.97	1.62	1.97	1.97	25.93
2159	.....do.....	.....do.....	Dunn.....	8.27	1.34	.30	1.99	1.64	1.99	1.75	23.91
316	Armour Fertilizer Works, Wilmington, N. C.....	Armour's Slaughter House Fertilizer.....	Vineland.....	8.06	1.14	.70	2.24	1.84	2.24	1.93	25.44
2119	.....do.....	.....do.....	Indian Trail.....	8.35	1.18	.50	2.04	1.68	2.04	1.74	24.11
2496	.....do.....	.....do.....	Shelby.....	7.96	1.00	.56	1.89	1.56	1.89	1.85	23.74
335	Atlantic Chemical Co., Norfolk, Va.....	Atlantic Soluble Guano for Tobacco.....	Henderson.....	7.75	1.04	.76	2.19	1.80	2.19	2.08	25.71
2174	Baugh & Sons Co., Philadelphia, Pa.....	Baugh's Durable Plant Food.....	Elizabeth City.....	7.72	.98	.74	2.09	1.72	2.09	2.24	26.14

420	.....do.....	Baugh's Old Standby Compound for Tobacco.	Burlington.....	8.15	1.14	.62	1.76	2.14	2.06	25.84
2775	.....do.....	.....do.....	Trenton.....	10.35	1.02	.40	1.42	1.73	1.84	25.51
2806	.....do.....	Baugh's Tobacco Guano.....	Trenton.....	8.11	1.10	.64	1.74	2.11	2.07	25.77
2592	Berkley Chemical Co., Norfolk, Va.....	Long Leaf Tobacco Grower.....	Madison.....	9.55	1.14	.60	1.74	2.11	1.92	26.46
2574	Brown, H. P., Guano Co., Salisbury, N. C.....	Brown's Standard Grade Guano.....	Cove City.....	8.18	1.18	.46	1.64	1.99	1.79	24.02
2312	Bryant Fertilizer Co., Alexandria, Va.....	Bryant's Potomac Bone Special for Tobacco.	Burlington.....	7.92	1.42	.18	1.60	1.94	2.68	28.04
2535	.....do.....	Bryant's Special Fertilizer.....	Lumberton.....	8.62	.82	.74	1.56	1.89	1.92	24.77
454	Burton, C. J., Guano Co., Baltimore, Md.....	Burton's Butcher Bone.....	Greensboro.....	7.83	1.12	.42	1.54	1.87	1.67	22.65
2025	Columbia Guano Co., Norfolk, Va.....	Columbia Soluble Guano.....	Jamesville.....	7.79	1.06	.62	1.68	2.04	2.02	24.95
390	.....do.....	Columbia Soluble Guano for Tobacco.....	Senora.....	7.79	1.04	.66	1.70	2.07	1.97	24.78
2464	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers' Union 8-2-2 Guano.....	Ivanhoe.....	8.30	.94	.66	1.60	1.94	2.10	25.52
2425	.....do.....	.....do.....	Wake Forest.....	8.05	.62	1.10	1.72	2.09	2.02	25.37
2813	.....do.....	.....do.....	Kerr.....	8.44	.58	.94	1.52	1.85	1.78	23.72
2812	.....do.....	.....do.....	Kerr.....	8.99	.86	.86	1.72	2.09	2.03	26.36
2959	.....do.....	.....do.....	Wilson.....	9.02	.52	1.10	1.62	1.97	2.07	26.17
2710	.....do.....	.....do.....	Nashville.....	9.19	.48	1.26	1.74	2.11	1.91	26.05
2948	.....do.....	Farmers' Union 8-2-2 Tobacco Guano, Standard Grade.	Wilson.....	7.75	1.00	.94	1.94	2.36	1.95	25.55
2788	.....do.....	Farmers' Union 8-2-2 Tobacco Guano.....	Nashville.....	8.28	.96	.62	1.58	1.89	1.98	24.82
2712	.....do.....	.....do.....	Nashville.....	8.04	.68	.98	1.66	2.02	1.78	23.91
2710	.....do.....	.....do.....	Moneyers.....	8.57	.96	.54	1.50	1.82	1.72	23.47
493	.....do.....	Farmers' Union 8-2-2 Tobacco Guano, Standard Grade	Stem.....	8.27	.66	.80	1.46	1.78	1.69	22.85
199	Coweta Fertilizer Co., Newnan, Ga.....	Coweta Success Guano.....	Mount Gilead.....	8.69	1.22	.48	1.70	2.07	2.39	27.78
2303	Craven Chemical Co., New Bern, N. C.....	C. C. C. Tobacco Guano.....	Enfield.....	8.79	.38	1.10	1.48	1.80	1.94	24.71
2177	.....do.....	E-Lite Cotton Guano.....	Kinston.....	8.83	.26	1.18	1.44	1.75	2.00	24.88
2281	Farmers' Union Agency Co., Winston-Salem, N. C.....	Farmers' Union 8-2-2.....	Winston-Salem.....	7.18	.50	1.12	1.62	1.97	1.51	21.53
463	Georgia Chemical Works, Charlotte, N. C.....	Georgia Formula.....	Statesville.....	9.10	1.22	.46	1.68	2.04	1.82	25.26

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brands claiming			8.00	-----	-----	1.65	2.00	2.00	\$24.93
2064	Georgia Chemical Works, Augusta, Ga.....	Patapsco Ammoniated Dissolved Bone.....	Lumber Bridge.....	7.39	1.28	.50	1.78	2.16	2.10	25.37
2449	-----do-----	XXX Meal Mixture.....	Augusta.....	9.30	.56	1.00	1.56	1.89	1.64	24.05
2389	Greenville Oil and Fertilizer Co., Greenville, N. C.	Special Formula.....	Spring Hope.....	7.84	1.04	.60	1.64	1.99	1.33	21.38
492	Hubbard Fertilizer Co., Baltimore, Md.....	Hubbard's Exchange Guano.....	Stem.....	7.69	1.50	.34	1.84	2.24	1.92	25.02
2192	Imperial Company, Norfolk, Va.....	Imperial Crop Grower.....	Fayetteville.....	7.90	1.12	.58	1.70	2.07	1.82	24.14
452	-----do-----	Imperial Standard Premium Guano.....	Reidsville.....	8.20	.86	.76	1.62	1.97	1.83	24.15
451	-----do-----	Imperial Tobacco Guano.....	Pelham.....	9.16	1.24	.44	1.68	2.04	1.61	24.27
2346	-----do-----	do.....	Red Springs.....	8.56	1.06	.60	1.66	2.02	1.84	24.73
2308	Miller Fertilizer Co., Baltimore, Md.....	Ammoniated Dissolved Bone.....	Siler City.....	7.62	.92	.62	1.54	1.87	2.08	24.49
2869	-----do-----	do.....	Oxford.....	7.96	1.14	.50	1.64	1.99	1.71	23.40
209	Navassa Guano Co., Wilmington, N. C.....	Navassa Cotton Fertilizer.....	Dunn.....	9.88	1.00	.54	1.54	1.99	1.89	25.80
2022	-----do-----	Oconeechee Tobacco Guano.....	Jamesville.....	8.40	1.14	.44	1.58	1.92	2.31	26.59
449	-----do-----	do.....	Reidsville.....	8.24	1.18	.56	1.74	2.11	2.05	25.80
418	-----do-----	do.....	Haw River.....	7.65	1.24	.52	1.76	2.14	2.00	25.04
2772	N. C. Farmers' Union, Statesville, N. C.....	N. C. Farmers' Union 8-2-2.....	Trenton.....	8.95	1.34	.38	1.72	2.09	1.83	25.32
2784	-----do-----	N. C. Farmers' Union Guano 20.....	Nashville.....	8.05	1.08	.50	1.58	1.92	1.91	24.24

2584	do.....	N. C. Farmers' Union 8-2-2 Tobacco Guano.....	Trenton.....	9.65	1.38	.46	1.84	2.24	2.05	27.63
2804	do.....	do.....	Trenton.....	9.71	1.66	.42	2.08	2.53	1.83	27.60
2581	do.....	do.....	Trenton.....	9.66	1.28	.44	1.72	2.09	2.08	27.28
2582	do.....	do.....	Trenton.....	10.47	1.22	.42	1.64	1.99	1.94	27.06
2580	do.....	do.....	Trenton.....	9.72	1.24	.44	1.68	2.04	2.02	26.88
2800	do.....	do.....	Trenton.....	9.55	1.34	.40	1.74	2.11	1.91	26.41
2771	do.....	do.....	Trenton.....	9.30	1.42	.44	1.86	2.26	1.80	26.11
2358	do.....	do.....	Trenton.....	9.17	1.38	.46	1.84	2.24	1.76	25.70
2803	do.....	do.....	Trenton.....	8.92	1.38	.46	1.84	2.24	1.76	25.45
2774	do.....	do.....	Trenton.....	9.14	1.42	.42	1.88	2.29	1.66	25.34
2122	do.....	do.....	Beulaville.....	8.97	1.40	.36	1.76	2.14	1.71	24.91
2773	do.....	do.....	Trenton.....	9.80	1.30	.36	1.66	2.02	1.62	24.87
2770	do.....	do.....	Trenton.....	9.39	1.22	.40	1.62	1.97	1.73	24.84
2746	do.....	do.....	Trenton.....	8.29	.66	.86	1.52	1.85	2.03	24.82
338	do.....	N. C. Farmers' Union Tobacco Guano 20.	Roxboro.....	8.08	.98	.62	1.60	1.94	1.89	24.25
2341	Norfolk Fertilizing Co., Norfolk, Va.....	Oriana Crop Grower.....	Fayetteville.....	7.97	1.16	.76	1.92	2.33	1.91	25.58
387	do.....	Oriana Tobacco Guano.....	Roxboro.....	8.62	1.10	.62	1.72	2.09	1.89	25.29
2307	Ober, G., & Sons Co., Baltimore, Md.....	Ober's Standard Tobacco Fertilizer.....	Mebane.....	8.05	1.14	.68	1.82	2.21	2.29	27.14
2532	do.....	do.....	Pineview.....	7.72	1.16	.58	1.74	2.11	2.27	26.38
2867	do.....	do.....	Creedmoor.....	7.76	1.04	.70	1.74	2.11	2.22	26.17
416	do.....	do.....	Mebane.....	8.25	1.04	.84	1.88	2.29	1.90	25.65
2641	do.....	do.....	Fuquay Springs.....	7.99	1.06	.80	1.86	2.26	1.93	25.45
2865	do.....	do.....	Oxford.....	7.32	1.04	.64	1.68	2.04	1.91	23.93
373	Old Buck Guano Co., Richmond, Va.....	Old Buck Saxon Tobacco.....	Henderson.....	7.66	1.02	.70	1.72	2.09	1.95	24.63
2335	Palmetto Guano Corporation, Columbia, S. C.....	Palmetto Special Fertilizer.....	Spring Hope.....	8.72	1.04	.64	1.68	2.04	1.62	23.88
450	Palmetto Chemical Co., Washington, N. C.....	Palmetto Bone and Fish Guano.....	Stokesdale.....	8.37	1.02	.64	1.66	2.02	1.81	24.39

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
	Brands claiming			8.00	-----	-----	1.65	2.00	2.00	\$24.93
415	Patapsco Guano Co., Baltimore, Md.	Planters' Favorite	Mebane	8.42	1.18	.60	1.78	2.16	1.92	25.50
2061	do	do	Walnut Cove	8.01	1.08	.60	1.68	2.04	1.92	24.67
2909	do	do	Stovall	8.14	1.24	.38	1.62	1.97	1.80	23.94
385	do	Seagull Ammoniated Guano	Roxboro	8.44	1.12	.58	1.70	2.07	1.91	25.13
312	Peruvian Guano Corporation, Charleston, S. C.	Standard Peruvian Mixture	Chadbourn	7.99	1.04	.58	1.62	1.97	1.90	24.29
547	Pocahontas Guano Co., Lynchburg, Va.	Carrington's Banner Brand Guano	Madison	7.90	.56	1.06	1.62	1.97	1.98	24.60
2776	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Guano	Stony Point	8.25	1.00	.72	1.72	2.09	1.84	24.67
372	do	do	Kittrell	8.47	1.00	.66	1.66	2.02	1.84	24.64
2352	do	do	Maysville	8.43	1.04	.58	1.62	1.97	1.88	24.63
2961	do	Pocomoke Tobacco Guano	Lucama	8.90	.60	1.00	1.60	1.94	1.95	25.37
383	do	do	Semora	8.56	1.04	.70	1.74	2.11	1.89	25.32
323	do	do	LaGrange	8.53	1.14	.52	1.66	2.02	1.80	24.50
499	do	do	Roseboro	8.02	1.06	.56	1.62	1.97	1.80	23.82
2995	Powhatan Chemical Co., Richmond, Va.	Magic Tobacco Grower	Farmville	7.44	1.02	.64	1.66	2.02	2.17	25.26
270	do	do	Wilson	7.77	1.14	.66	1.80	2.19	1.93	24.98
2671	Rasin-Monumental Co., Baltimore, Md.	Rasin Old Empire Guano	Nashville	8.80	1.08	.82	1.90	2.31	1.99	26.73
2718	do	do	Nashville	8.75	.78	.82	1.60	1.94	1.99	25.42

2716	do	Rasin's Old Empire Guano for Tobacco	Nashville	8.51	.94	.84	1.78	2.16	2.07	26.34
2664	do	do	Nashville	7.90	1.22	.34	1.56	1.89	2.30	25.95
2670	do	do	Nashville	8.63	1.06	.74	1.80	2.19	1.80	25.19
2782	do	do	Spring Hope	8.91	1.06	.38	1.44	1.75	1.96	24.76
2063	Read Phosphate Co., Charleston, S. C.	Read's Blood and Bone Fertilizer No. 1	Lumber Bridge	7.75	.90	.54	1.44	1.75	1.84	23.00
2737	Reidsville Fertilizer Co., Reidsville, N. C.	Reidsville Champion Guano	Burch	7.75	1.14	.50	1.64	1.99	1.84	23.84
460	Richmond Guano Co., Richmond, Va.	Premium Brand Fertilizer	Cherryville	8.98	1.12	.54	1.66	2.02	1.32	22.55
333	do	Premium Tobacco Fertilizer	Creedmoor	8.17	1.02	.60	1.62	1.97	2.06	25.27
2188	Robertson Fertilizer Co., Norfolk, Va.	Double Dollar Tobacco Guano	Fayetteville	7.91	1.22	.48	1.70	2.07	1.59	23.00
2105	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Farmer's Bone Fertilizer	Roper	8.01	1.14	.82	1.96	2.38	1.94	25.94
2196	do	do	Manchester	8.03	.94	.64	1.58	1.92	1.92	24.27
281	do	do	Kinston	7.98	1.10	.54	1.64	1.90	1.86	24.17
2744	do	do	Trenton	8.10	.76	.80	1.56	1.89	1.85	23.90
489	do	Royster's Farmers' Bone Fertilizer for Tobacco	Stem	8.01	1.02	.70	1.72	2.09	1.93	24.88
2908	do	do	Creedmoor	8.53	.72	.84	1.56	1.89	1.66	23.38
2951	Southern Cotton Oil Co., Fayetteville, N. C.	Fayetteville Oil Mill Standard Cotton-seed Meal	Vander	7.59	.98	.98	1.96	2.38	1.55	23.57
2554	do	do	Hope Mills	7.94	.74	.80	1.54	1.87	1.54	22.11
2557	do	do	Fayetteville	8.33	.60	.82	1.42	1.73	1.52	21.89
2995	Southern Cotton Oil Co., Goldsboro, N. C.	Soco Standard Fertilizer	Whitakers	7.34	.54	1.24	1.78	2.16	1.77	23.67
2963	do	Southern Cotton Oil Co.'s Standard Fertilizer	Lucama	7.55	.50	.86	1.36	1.65	1.95	23.01
2490	Southern Cotton Oil Co., Shelby, N. C.	Southern Cotton Oil Co.'s Ammoniated	Lawndale	8.32	.68	.94	1.62	1.97	2.57	27.97
2939	do	Soco Ammoniated	Lawndale	8.34	.10	1.62	1.72	2.09	1.92	25.16
2962	Swift & Co. Fertilizer Works, Wilmington, N. C.	Swift's Red Steer for Tobacco, Standard Grade Guano	Lucama	8.19	1.36	.26	1.62	1.97	2.53	27.67
2906	do	do	Lyons	8.67	.98	.62	1.60	1.94	2.01	25.44
2903	do	do	Stem	8.71	.84	.74	1.58	1.89	1.83	24.50
2907	do	do	Creedmoor	8.85	.80	.72	1.52	1.85	1.83	24.38

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
	Brands claiming.....			8.00	-----	-----	1.65	2.00	2.00	\$24.93
413	Swift & Co. Fertilizer Works, Wilmington, N.C.	Swift's Red Steer for Tobacco, Standard Grade Guano.	Effland.....	8.05	.58	1.06	1.64	1.99	1.84	24.14
398	-----do-----	-----do-----	Cliffside.....	8.47	1.06	.74	1.80	2.19	1.61	24.08
534	-----do-----	-----do-----	Pink Hill.....	7.98	.76	.74	1.50	1.82	1.95	24.03
2210	Tennessee Chemical Co., Greensboro, N. C.	Ox Fertilizer, 8-2-2.....	Mount Airy.....	7.98	.62	1.08	1.70	2.07	1.80	24.12
84	Tuscarora Fertilizer Co., Greensboro, N. C.	Standard Tobacco Grower.....	Greensboro.....	8.53	.75	.76	1.51	1.84	1.98	24.77
2734	-----do-----	-----do-----	Rockford.....	8.25	.80	.82	1.62	1.97	1.93	24.70
304	Union Guano Co., Winston-Salem, N. C.	Fish Brand Ammoniated Guano for Tobacco.	Vineland.....	9.00	1.40	.42	1.82	2.21	2.07	26.99
445	-----do-----	-----do-----	Greensboro.....	9.77	.98	.58	1.56	1.89	2.11	26.87
2841	-----do-----	-----do-----	Williamston.....	8.70	.34	1.18	1.52	1.85	1.87	24.43
543	Union Guano Co., Winston, N. C.	Old Honest Tobacco Grower.....	Walnut Cove.....	8.05	1.10	.60	1.70	2.07	2.18	26.09
407	-----do-----	-----do-----	Spikeville.....	9.91	1.22	.40	1.62	1.97	1.80	25.71
2847	-----do-----	-----do-----	Kerr.....	8.79	1.38	.22	1.60	1.94	1.70	24.01
380	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Anchor Brand Fertilizer.	Roxboro.....	7.97	1.14	.50	1.64	1.99	2.06	25.16
2867	-----do-----	Ajax Cotton Seed Meal.....	Oxford.....	7.97	.80	.86	1.66	2.02	2.39	26.89
274	-----do-----	-----do-----	Kenly.....	7.51	1.16	.74	1.90	2.31	1.66	23.79
346	-----do-----	Davie & Whittles Owl Brand Guano.....	Vineland.....	8.74	1.12	.50	1.62	1.97	1.98	25.44
2001	-----do-----	-----do-----	Williamston.....	8.89	.42	1.04	1.46	1.78	2.02	25.12

444	---do-----	Durham Fertilizer Co.'s Genuine Bone and Peruvian Guano.	Stokesdale.....	9.20	1.20	.60	1.80	2.19	2.10	27.26
2645	---do-----	Durham Fertilizer Co.'s Progressive Farmer Guano.	Coinjock.....	8.50	.52	1.16	1.68	2.04	2.42	27.66
273	---do-----	Farmers' Favorite Fertilizer C. S. M.	Kenly.....	8.80	1.16	.82	1.98	2.41	2.08	27.52
2457	---do-----	do.....	Ivanhoe.....	8.80	.60	1.02	1.62	1.97	1.60	23.60
222	---do-----	Norf. and Car. Chem. Co.'s Genuine Slaughter House Bone Guano.	Washington.....	8.10	.80	1.10	1.90	2.31	1.70	24.58
367	---do-----	Old Dominion Guano Co.'s Soluble Guano	Wake Forest.....	7.82	1.50	.58	2.08	2.53	2.12	27.16
2900	---do-----	Old Dominion Guano Co.'s Farmers' Friend Fertilizer.	Creedmoor.....	7.72	.74	1.36	2.10	2.55	1.54	24.24
240	---do-----	Old Dominion Guano Co.'s Soluble Tobacco Guano.	Enfield.....	9.32	1.48	.32	1.80	2.19	1.74	25.58
2911	---do-----	Plant Food C. S. M.	Roxboro.....	8.81	.68	.70	1.38	1.68	2.10	25.11
2059	---do-----	Stonewall Tobacco Guano	Windsor.....	7.75	1.54	.56	2.10	2.55	1.83	25.72
2060	---do-----	do.....	Walnut Cove.....	9.62	.90	.60	1.50	1.82	1.84	25.12
2730	---do-----	do.....	Elkin.....	9.37	1.10	.50	1.60	1.94	2.03	26.24
381	---do-----	Travers & Co.'s National Special Tobacco	Roxboro.....	8.18	1.06	.54	1.60	1.94	1.94	24.60
	Brand claiming			8.00	-----	-----	1.65	2.00	4.00	34.93
2300	Peruvian Guano Corporation, Charleston, S. C.	Peruvian Mixture.....	Battleboro.....	8.64	1.30	.22	1.52	1.85	3.91	34.57
	Brand claiming			8.00	-----	-----	1.85	2.25	1.25	22.02
2919	American Agricultural Chemical Co., New York, N. Y.	Quinnipiac Ammoniated Bone Phosphate.	Mebane.....	7.93	1.20	.60	1.80	2.19	1.41	22.54
	Brands claiming			8.00	-----	-----	2.06	2.50	2.00	26.65
2444	Atlantic Chemical Corporation, Norfolk, Va.	Atlantic Tobacco Compound.....	Kenly.....	8.22	1.28	.80	2.08	2.53	1.84	26.16
2062	Navassa Guano Co., Wilmington, N. C.	Navassa Guano for Tobacco.....	Walnut Cove.....	8.60	1.52	.42	1.94	2.36	2.34	28.45
2531	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Special Tobacco Compound.....	Pineview.....	7.79	1.44	.70	2.14	2.60	2.22	27.88
	Brands claiming			8.00	-----	-----	2.06	2.50	3.00	31.65
2213	Bryant Fertilizer Co., Alexandria, Va.	Otter's Special Tobacco Fertilizer.....	Pinnacle.....	8.11	1.76	.50	2.26	2.75	4.69	41.05
2102	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Oriana Tobacco Guano.....	Williamston.....	7.67	1.56	.74	2.00	2.43	2.89	30.52
	Brand claiming			8.00	-----	-----	2.26	2.75	2.00	27.99
2669	Resin-Monumental Co., Baltimore, Md.	Dixie Tobacco.....	Nashville.....	8.76	.66	1.64	2.30	2.80	2.00	28.42

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917. MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
2901	Brand claiming..... Va.-Car. Chemical Co., Richmond, Va.....	V.-C. Royal Crown, C. S. M.....	Creedmoor.....	8.00	1.14	1.50	2.26	2.75	2.00	\$27.99
2276	Brand claiming..... American Agricultural Chemical Co., New York, N. Y.....	Bradley's Sea Fowl Guano.....	Tunis.....	8.00	2.00	.54	2.39	2.91	2.00	28.14
2721	Brands claiming..... Farmers Cotton Oil Co., Wilson, N. C.....	Farmers Cotton Oil Co.'s Meal Mixture	Sims.....	8.00			2.47	3.00	.50	20.87
306	Union Seed and Fertilizer Co., Wilmington, N.C.	U. S. & F. Co. Brand No. 6.....	Chadbourne.....	8.74	.64	1.66	2.30	2.80	.66	21.70
405	Brands claiming..... American Fertilizer Co., Norfolk, Va.....	Guano Revised.....	Wadesboro.....	8.37	.48	1.62	2.10	2.55	.64	20.39
2232	.....do..... Wizard Crop Grower.....	Wizard Crop Grower.....	Tunis.....	8.00			2.47	3.00	1.00	23.37
2920	American Agricultural Chemical Co., New York, N. Y.....	Canton Chemical High Grade Ammoniated Superphosphate with Potash.	Burlington.....	9.61	1.48	.82	2.30	2.80	.99	24.22
2608	.....do..... Lazaretto Ammoniated Superphosphate with Potash.	Lazaretto Ammoniated Superphosphate with Potash.	Walstonburg.....	7.89	1.56	1.20	2.76	3.36	3.36	26.19
2606	.....do..... do.....	do.....	Wilson.....	8.55	1.52	1.00	2.52	3.06	.93	24.08
412	.....do..... Standard Fertilizer.....	Standard Fertilizer.....	Wilson.....	8.53	1.62	.76	2.38	2.89	1.16	24.33
2889	Armour Fertilizer Works, Wilmington, N. C.....	Armour's 8-3-1 Fertilizer.....	Zebulon.....	8.32	1.34	.66	2.00	2.43	1.29	23.17
2603	Bowker Fertilizer Co., New York, N. Y.....	Bowker Ammoniated Superphosphate with Potash.	Fayetteville.....	9.52	1.62	1.22	2.84	3.45	1.40	28.45
455	Burton, C. J., Guano Co., Baltimore, Md.....	Burton's Choice.....	Walstonburg.....	7.79	1.18	1.06	2.24	2.72	1.67	25.75
			Greensboro.....	8.90	1.50	.84	2.34	2.84	.57	21.62
				7.91	1.74	.60	2.34	2.84	.99	22.69

2598	Coe Mortimer Co., Charleston, S. C.....	Coe Mortimer Co. Fertilizer.....	Wilson.....	8.22	1.80	.76	2.56	3.11	.98	23.87
2873	Columbia Guano Co., Norfolk, Va.....	Columbia Zelo Tobacco Fertilizer.....	Kernersville.....	8.66	1.56	.86	2.42	2.94	1.07	24.17
2936	Contentnea Guano Co., Wilson, N. C.....	Matchless Tobacco Guano.....	Lucama.....	7.65	.96	1.32	2.28	2.77	.93	21.88
2708	Coöperative Warehouse Co., Salisbury, N. C.....	Farmer's Union 8-3-1 Guano.....	Nashville.....	9.82	1.26	1.02	2.28	2.77	1.26	25.70
2713	.....do.....	.....do.....	Nashville.....	7.55	1.02	1.32	2.34	2.84	1.65	25.63
2726	.....do.....	.....do.....	Nashville.....	7.62	1.04	1.26	2.30	2.80	.96	22.08
409	Farmers Cotton Oil Co., Wilson, N. C.....	F. C. O. Co.'s C. S. Meal Mixture.....	Zebulon.....	8.30	.64	1.38	2.02	2.46	.74	20.48
2935	Fremont Oil Mill Co., Fremont, N. C.....	Fremont Oil Mills Co. 8-3-1.....	Lucama.....	7.83	1.08	1.02	2.10	2.55	1.02	21.75
2617	Grandy & Co., N. G., Elizabeth City, N. C.....	Grandy's 3-8-1 Fertilizer.....	Elizabeth City.....	9.26	2.88	.16	3.04	3.70	.85	26.28
266	Harris Coöperative Co., Wilson, N. C.....	Harris' Complete Guano.....	Wilson.....	8.10	1.24	1.26	2.50	3.04	1.14	24.30
2010	Hubbard Fertilizer Co., Baltimore, Md.....	Hubbard 3-8-1 Fertilizer.....	Robersonville.....	8.37	2.04	.46	2.50	3.04	1.08	24.27
2916	Listers Agricultural Chemical Works, Newark, N. J.....	Listers' Complete Manure, 1916.....	Mebane.....	8.39	1.32	.86	2.18	2.65	1.05	22.80
2681	Navassa Guano Co., Wilmington, N. C.....	Navassa Cotton-seed Meal Special Guano Revised.....	White Oak.....	8.28	1.20	1.32	2.52	3.06	1.12	24.46
2682	.....do.....	Navassa Cotton-seed Meal Special 3% Guano Revised.....	Luna.....	9.05	1.70	.70	2.40	2.92	1.04	24.33
374	.....do.....	.....do.....	Franklinton.....	7.86	1.30	.78	2.08	2.53	1.22	22.69
389	North Caroling Farmers Union, Statesville, N. C.....	North Carolina Farmers Union Guano.....	Roxboro.....	7.89	1.16	1.22	2.38	2.89	1.20	23.89
269	Ober, G., & Sons Co., Baltimore, Md.....	Ober's Golden Seal Tobacco Guano.....	Fremont.....	8.12	1.48	1.14	2.62	3.19	1.37	25.97
2835	Old Buck Guano Co., Richmond, Va.....	Old Buck Dundee Tobacco Meal Body.....	Williamston.....	8.08	1.32	1.06	2.38	2.89	1.12	23.68
2931	Patapsco Guano Co., Baltimore, Md.....	Choctaw Guano 1916.....	Lucama.....	8.40	1.56	.74	2.30	2.80	.90	22.56
271	Powhatan Chemical Co., Richmond, Va.....	Hustler Tobacco Special.....	Wilson.....	7.86	1.70	.68	2.38	2.89	1.28	24.26
2719	.....do.....	.....do.....	Sims.....	7.67	1.26	1.50	2.76	3.36	.94	23.96
474	.....do.....	.....do.....	Macon.....	8.04	1.30	1.02	2.32	2.82	1.03	22.93
2933	.....do.....	.....do.....	Wilson.....	8.37	1.20	1.10	2.32	2.82	.95	22.86
2827	Rasin Monumental Co., Baltimore, Md.....	Rasin's Gold Standard.....	Nashville.....	7.75	1.92	1.08	3.00	3.65	1.56	28.15
2703	.....do.....	.....do.....	Nashville.....	8.65	1.88	.84	2.72	3.31	1.30	26.57

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	
	Brands claiming			8.00	---	---	2.47	3.00	1.00 \$23.37
2382	Rasin Monumental Co., Baltimore, Md.	Rasin's Indian Brand for Tobacco	Nashville	8.72	1.74	.28	2.02	2.46	1.27 23.55
2662	Richmond Guano Co., Richmond, Va.	Gilt Edge Tobacco Special	Nashville	8.03	1.50	.70	2.20	2.67	1.02 22.37
244	do.	do.	Spring Hope	8.16	1.78	.68	2.46	2.99	1.19 24.42
2253	Robeson Manufacturing Co., Lumberton, N. C.	R. M. C. 8-3-1	Hope Mills	8.18	1.48	1.94	3.42	4.16	1.24 28.74
490	Robertson Fertilizer Co., Norfolk, Va.	Robertson's 3-8-1 Guano	Greedmoor	7.57	1.46	.80	2.26	2.75	1.02 22.16
2106	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Drill Well Guano	Roper	7.75	1.70	.86	2.56	3.11	1.07 23.85
519	Southern Cotton Oil Co., Goldsboro, N. C.	S. C. O. Co., Ammoniated	Beason	8.13	1.54	1.42	2.96	3.60	1.23 26.71
2914	Tidewater Guano Co., Norfolk, Va.	Tidewater 3-8-1 Guano	Roxboro	8.66	1.46	.54	2.00	2.46	.96 21.86
2733	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Fertilizer No. 831	Rockford	8.15	1.44	1.30	2.74	3.33	.99 24.61
2208	Union Guano Co., Norfolk, Va.	Union 8-3-1	Mount Airy	8.97	1.80	.52	2.32	2.82	1.23 24.86
533	Va.-Car. Chemical Co., Richmond, Va.	Farmers' Friend Special Tobacco Fertilizer.	Vanceboro	9.00	1.52	.80	2.32	2.82	1.23 24.89
382	do.	Old Dominion Co.'s Farmers' Friend High Grade Fertilizer.	Roxboro	8.33	1.50	1.24	2.74	3.33	1.06 25.14
2162	do.	Royal High Grade Fertilizer Revised	Weeksville	8.02	1.28	.98	2.26	2.75	1.28 23.91
219	do.	V. C. C. Co.'s Farmers' Friend High Grade Fertilizer Revised.	Washington	7.20	1.26	1.18	2.44	2.97	1.15 23.20
	Brands claiming			8.00	---	---	2.47	3.00	2.00 28.37
338	American Agricultural Chemical Co., New York,	High Grade Tobacco Manure	Henderson	8.27	1.14	1.30	2.44	2.97	2.33 30.17
2870	do.	do.	Oxford	8.07	1.12	1.18	2.30	2.80	1.96 28.37

2609	.....do.....	Lazaretto Special Tobacco and Potato Fertilizer.	Wilson.....	7.99	1.68	.74	2.42	2.94	2.01	28.20
2605	.....do.....	Lazaretto Special Tobacco and Potato Fertilizer.	Walstonburg.....	7.77	1.64	.74	2.38	2.89	1.79	26.72
2607	.....do.....	do.....	Walstonburg.....	8.24	1.46	.94	2.40	2.92	1.90	27.82
2672	Armour Fertilizer Works, Wilmington, N. C.....	Armour's No. 832 Fertilizer.	Fayetteville.....	7.71	1.48	1.12	2.60	3.16	1.76	27.43
541	.....do.....	Armour's Tobacco Fertilizer.	Pink Hill.....	8.14	1.00	1.24	2.24	2.72	2.51	30.10
2687	.....do.....	do.....	Lena.....	8.51	1.42	.88	2.30	2.80	1.98	28.07
2601	Baugh & Sons Co., Norfolk, Va.....	Baugh's High Grade Tobacco Guano.	Goldsboro.....	8.15	1.62	.82	2.44	2.97	2.32	30.00
2416	.....do.....	do.....	Cove City.....	7.99	1.82	.66	2.48	3.02	2.20	29.41
2611	.....do.....	do.....	Robersonville.....	8.00	1.74	.66	2.40	2.92	2.26	29.37
2479	.....do.....	do.....	Grafton.....	7.63	1.62	.82	2.44	2.97	2.26	29.18
2481	.....do.....	do.....	Grafton.....	8.10	1.74	.66	2.40	2.92	2.14	28.88
2176	.....do.....	do.....	Fort Barnwell.....	7.76	1.66	.78	2.44	2.97	2.16	28.81
276	.....do.....	do.....	Kinston.....	8.00	1.70	.72	2.42	2.94	2.11	28.71
2604	Bowker Fertilizer Co., New York, N. Y.....	Bowker's Tobacco Fertilizer.	Walstonburg.....	8.37	1.68	.70	2.38	2.89	1.69	26.82
2576	Brown, H. P., Guano Co., Salisbury, N. C.....	Brown's 8-3-2	Cove City.....	7.58	1.42	.88	2.30	2.80	1.83	26.39
2762	Carolina Union Fertilizer Co., Norfolk, Va.....	Carolina Union 3-8-2.	Ahoskie.....	7.88	1.62	.80	2.42	2.94	1.71	26.59
2704	Chesapeake Chemical Co., Baltimore, Md.....	Chesapeake Chemical Co.'s Fish and Tobacco Guano.	Nashville.....	8.29	2.24	.32	2.56	3.11	2.08	29.44
2828	.....do.....	do.....	Whitakers.....	8.43	2.12	.38	2.50	3.04	1.67	27.78
325	Columbia Guano Co., Norfolk, Va.....	Columbia Tally Ho Tobacco Guano.	Kinston.....	7.95	1.74	.76	2.50	3.04	2.06	28.75
2420	Conetoe Fertilizer Co., Newnan, Ga.....	Conetoe Perfection Standard Guano.	Wadesboro.....	11.24	1.58	.64	2.22	2.70	1.96	30.36
2526	Contentnea Guano Co., Wilson, N. C.....	High Grade Tobacco Grower	Cove City.....	7.32	1.18	1.28	2.46	2.99	1.88	27.05
2946	.....do.....	do.....	Kenly.....	7.54	1.64	.74	2.38	2.89	1.84	26.74
203	.....do.....	Special Tobacco Grower.....	Walstonburg.....	7.74	.90	1.40	2.30	2.80	1.33	24.05
2725	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers Union 8-3-2 Guano C. S. M.....	Nashville.....	9.23	.96	1.32	2.28	2.77	2.03	28.96
2787	.....do.....	Farmers' Union 8-3-2 Tobacco Guano.....	Nashville.....	8.05	1.82	.46	2.28	2.77	2.01	27.68
2724	.....do.....	do.....	Nashville.....	9.00	1.46	.76	2.12	2.58	1.77	26.75

ANALYSIS OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brands claiming			8.00	-----	-----	2.47	3.60	2.00	\$28.37
2832	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 8-3-2 Tobacco Guano	Battleboro.....	7.27	.08	1.36	2.04	2.48	1.92	25.44
2478	Craven Chemical Co., New Bern, N. C.	C. C. Co.'s Tobacco Special Revised	Grifton.....	7.53	1.56	1.10	2.66	3.23	2.26	30.00
264	do.....	do.....	Fremont.....	8.27	1.36	.88	2.24	2.72	1.74	26.38
2752	do.....	do.....	Trenton.....	9.18	1.22	.80	2.02	2.46	1.72	26.26
2748	do.....	do.....	Trenton.....	8.42	1.00	1.04	2.04	2.48	1.63	25.14
2041	Farmers Fertilizer Works, Spartanburg, S. C.	Red Rooster Fertilizer	Red Springs.....	8.63	1.58	.80	2.38	2.89	1.93	28.27
2042	do.....	do.....	Red Springs.....	8.47	1.58	.76	2.34	2.84	1.77	27.15
2219	Farmville Oil and Fertilizer Co., Farmville, N. C.	8-3-2 Special Formula for Tobacco	Farmville.....	8.24	1.00	1.56	2.56	3.11	1.90	28.49
2934	Fremont Oil Mill Co., Fremont, N. C.	Fremont Oil Mill Co., 8-3-2 Fertilizer	Lucama.....	3.29	1.44	.84	2.32	2.82	1.72	25.63
2997	Georgia Chemical Works, Augusta, Ga.	Three Oaks High Grade Guano	Lumber Bridge.....	8.46	2.08	.18	2.26	2.75	2.05	28.20
288	do.....	Gold Leaf Tobacco Compound Revised	Kinston.....	8.32	2.18	.42	2.60	3.16	2.24	30.44
2326	do.....	Georgia Tobacco Special Revised	Cove City.....	9.05	1.70	.60	2.30	2.80	2.28	30.11
2510	do.....	do.....	Cove City.....	8.17	1.82	.42	2.24	2.72	1.99	27.53
2531	Greenville Oil and Fertilizer Co., Greenville, N. C.	Fish and Meal Tobacco Grower	Greenville.....	7.39	.20	3.30	3.50	4.26	.91	26.64
268	do.....	Special Formula for Tobacco	Red Bank.....	7.68	1.72	.66	2.36	2.87	1.47	24.94
491	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard Yellow Wrapper	Stem.....	7.84	2.10	.38	2.48	3.02	1.89	27.71
2089	Imperial Co., Norfolk, Va.	Imperial X. L. O. Crop Grower	Currituck.....	8.44	1.60	.88	2.48	3.02	2.04	29.06

432	-----do-----	Cubanola Tobacco Grower-----	Greenville-----	8.70	1.44	.92	2.36	2.87	1.37	27.96
2523	Meadows, E. H. & J. A. Co., New Bern, N. C.---	Meadows Gold Leaf Grower-----	Cove City-----	7.02	1.34	1.10	2.44	2.97	1.73	25.92
2568	-----do-----	-----do-----	Cove City-----	7.74	.48	1.34	1.82	2.41	1.97	25.23
2399	Miller Fertilizer Co., Baltimore, Md.-----	Miller's Standard-----	Point Harbor-----	8.09	1.68	.62	2.30	2.80	1.90	27.25
2052	Navassa Guano Co., Wilmington, N. C.-----	Clarendon Tobacco Guano, Revised---	Bethel-----	8.34	1.78	1.22	3.00	3.55	1.59	28.89
2108	-----do-----	-----do-----	Williamston-----	9.01	1.54	.96	2.50	3.04	1.85	28.76
419	-----do-----	-----do-----	Haw River-----	8.02	1.66	.76	2.42	2.94	1.93	27.83
2475	-----do-----	Navassa Tobacco Guano, Revised---	Grifton-----	7.32	2.54	.56	3.30	4.01	2.57	34.03
2550	N. C. Farmers' Union, Statesville, N. C.-----	N. C. Farmers' Union Guano 8-3-2---	Maple-----	7.87	1.36	.86	2.22	2.70	2.12	27.79
2182	New Bern Cotton Oil and Fertilizer Mills, New Bern N. C.	Special Meal and Fish Guano-----	Fort Barnwell---	7.93	.88	1.98	2.86	3.48	2.06	30.24
2180	-----do-----	Special Tobacco Grower-----	Fort Barnwell---	9.08	.90	1.72	2.62	3.19	1.80	29.08
2217	-----do-----	Superb Tobacco Grower, C. S. M.---	Snow Hill-----	7.87	.36	2.32	2.68	3.26	2.18	30.03
484	-----do-----	-----do-----	Newport-----	9.36	1.70	.72	2.42	2.94	1.98	29.32
2268	Ober, G., & Sons Co., Baltimore, Md.-----	Ober's Spear Head Tobacco Guano---	Ahoskie-----	8.37	1.58	1.10	2.64	3.21	2.11	30.01
268	-----do-----	-----do-----	Fremont-----	8.22	1.68	1.16	2.84	3.45	2.19	29.84
2857	-----do-----	-----do-----	Kerr-----	9.01	1.04	1.34	2.38	2.89	2.09	29.46
2868	-----do-----	-----do-----	Creedmoor-----	7.17	1.60	.88	2.48	3.02	2.11	28.14
2638	-----do-----	-----do-----	Fuquay Springs---	7.54	1.48	1.10	2.58	3.14	1.94	28.08
2866	-----do-----	-----do-----	Oxford-----	7.17	1.68	.68	2.36	2.87	2.02	27.18
2336	Palmetto Guano Corporation, Columbia, S. C.---	Palmetto Ammoniated Guano-----	Spring Hope-----	7.77	1.80	.74	2.54	3.09	2.00	28.44
2005	Pamlico Chemical Co., Washington, N. C.-----	Pamlico Prosperity Tobacco Guano---	Robersonville---	8.23	1.22	1.26	2.48	3.02	1.89	28.10
2930	Patapsco Guano Co., Baltimore, Md.-----	Patapsco High Grade Tobacco Special---	Lucama-----	8.34	1.64	.68	2.32	2.82	1.89	27.53
525	-----do-----	-----do-----	Rocky Mount-----	8.07	1.68	.64	2.32	2.82	1.76	26.61
246	-----do-----	-----do-----	Rocky Mount-----	8.07	1.70	.60	2.36	2.87	1.72	26.58

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brands claiming			8.06			2.47	3.00	2.00	\$28.37
2854	Pearsall & Co., Wilmington, N. C.	Pearsall's Use-Me Guano, High Grade.	Kerr.	8.02	1.02	1.38	2.40	2.92	2.05	28.35
2853	do.	do.	Kerr.	8.17	1.04	1.40	2.44	2.97	1.95	28.17
2855	do.	do.	Kerr.	7.84	1.24	1.44	2.68	3.26	1.42	26.20
2006	Phillips Fertilizer Co., Washington, N. C.	Phillips' High Grade Tobacco Guano, 3-8-2.	Washington.	8.82	1.06	1.22	2.38	2.89	1.89	27.85
322	Pocomoke Guano Co., Norfolk, Va.	Monarch Tobacco Special.	LaGrange.	8.24	1.78	.66	2.44	2.97	2.14	29.19
2834	do.	do.	Williamston.	8.04	1.78	.82	2.60	3.16	2.02	29.06
2577	do.	do.	Trenton.	8.46	1.72	.64	2.36	2.87	2.05	28.52
2613	do.	Pocomoke 3-8-2 Fertilizer.	Jarvisburg.	7.71	1.76	.60	2.36	2.87	1.93	27.27
526	Powhatan Chemical Co., Richmond, Va.	Special Tobacco Fertilizer, 8-3-2.	Wilson.	7.96	2.20	.50	2.76	3.36	2.10	30.05
2594	do.	Special Tobacco Fertilizer.	Wilson.	8.09	1.96	.56	2.52	3.06	2.06	28.97
285	do.	do.	Kinston.	7.61	1.82	.62	2.44	2.97	2.07	28.21
2720	do.	Special Tobacco Fertilizer, 8-3-2.	Sims.	8.15	1.50	1.00	2.50	3.04	1.80	27.65
2702	Rasin-Monumental Co., Baltimore, Md.	Rasin Indian Brand for Tobacco.	Nashville.	8.69	1.84	.92	2.76	3.36	2.16	31.08
2715	do.	do.	Nashville.	7.34	2.14	.40	2.54	3.09	2.24	29.21
2667	do.	do.		8.16	1.66	.70	2.36	2.87	2.20	29.07
2739	Reidsville Fertilizer Co., Reidsville, N. C.	Broad Leaf Tobacco Fertilizer.	Burch.	8.20	1.46	.90	2.36	2.87	1.65	26.36

20663	Richmond Guano Co., Richmond, Va.....	Special Tobacco Fertilizer.....	Nashville.....	8.35	1.42	.96	2.38	2.89	2.09	28.80
2446	Robeson Mfg. Co., Lumberton, N. C.....	Tobacco Special.....	St. Paul.....	8.01	.80	1.62	2.42	2.91	1.69	26.62
2407	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Delta Tobacco Fertilizer.....	Cove City.....	8.04	1.72	.74	2.46	2.99	2.22	29.47
2797	do.....	do.....	Trenton.....	8.11	1.26	1.18	2.44	2.97	2.19	29.31
282	do.....	do.....	Kinston.....	8.19	1.82	.84	2.66	3.23	1.96	29.16
2503	do.....	do.....	Cove City.....	8.27	1.70	.74	2.44	2.97	2.06	28.81
2515	do.....	do.....	Cove City.....	8.20	1.74	.78	2.52	3.06	1.99	28.73
2499	do.....	do.....	Cove City.....	8.17	1.88	.72	2.60	3.16	1.89	28.54
2064	do.....	do.....	Robersonville.....	7.80	1.40	.88	2.28	2.77	2.06	27.67
2056	Southern Cotton Oil Co., Goldsboro, N. C.....	Secco Ammoniated Fertilizer.....	Robersonville.....	6.87	1.28	1.02	2.30	2.80	2.06	26.83
2297	do.....	do.....	Whitakers.....	7.20	1.00	1.70	2.70	3.28	1.65	26.79
2851	Swift & Co. Fertilizer Works, Wilmington, N. C.....	Swift's Special Tobacco Grower, High Grade Guano.....	Kerr.....	8.20	1.46	.94	2.40	2.92	2.02	28.38
2134	do.....	do.....	Robersonville.....	8.01	1.26	1.08	2.34	2.84	1.88	27.24
535	Swift & Co. Fertilizer Works, Columbia, S. C.....	do.....	Pink Hill.....	7.68	1.14	1.06	2.20	2.67	1.96	26.72
2843	Swift & Co. Fertilizer Works, Baltimore, Md.....	Swift's Three-Eight-Two Brand, High Grade 8-2-2.....	Elizabeth City.....	7.06	1.56	.74	2.30	2.80	2.00	26.72
2939	Tuscarora Fertilizer Co., Greensboro, N. C.....	Tuscarora Fertilizer, No. 832.....	Lucama.....	7.65	.98	1.42	2.40	2.92	1.90	27.23
2736	do.....	Tuscarora Tobacco Fertilizer.....	Rockford.....	7.91	1.06	1.18	2.24	2.72	1.94	27.02
318	Union Guano Co., Winston-Salem, N. C.....	Victoria High Grade Tobacco Fertilizer Revised.....	Kinston.....	7.89	1.72	.50	2.22	2.70	2.24	28.41
522	Va.-Car. Chemical Co., Richmond, Va.....	Amazon High Grade Special Guano.....	Rocky Mount.....	9.12	2.04	.44	2.48	3.02	1.94	29.24
2057	do.....	Bright Leaf Tobacco Grower, Revised.....	Bethel.....	8.69	2.00	1.16	3.16	3.84	1.90	31.46
2470	do.....	do.....	Grifton.....	8.59	1.52	1.18	2.70	3.28	2.00	29.93
2764	do.....	do.....	Trenton.....	8.57	1.68	.78	2.46	2.99	2.11	29.45
277	do.....	do.....	Kinston.....	8.50	2.18	.24	2.42	2.94	2.11	29.21
2350	do.....	do.....	Trenton.....	8.54	1.68	.58	2.26	2.75	2.06	28.33
2471	do.....	do.....	Grifton.....	8.90	1.40	.96	2.36	2.87	1.73	27.46
472	do.....	Durham Fertilizer Co.'s Yellow Leaf Tobacco Grower.....	Macon.....	8.05	1.28	.72	2.00	2.43	2.24	27.65

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Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
	Brands claiming			8.66	---	---	2.47	3.60	2.00	\$28.37
2822	Va.-Car. Chemical Co., Richmond, Va.	Farmers' Friend Special Tobacco Fertilizer.	Barber's Landing	8.60	1.64	.64	2.30	2.80	2.12	28.86
2807	do.	Gold Medal High Grade Tobacco Guano.	Clinton	9.05	1.48	.48	2.36	2.87	2.15	29.71
2000	do.	Owl Brand Guano for Tobacco.	Williamston	8.65	1.34	1.16	2.50	3.04	1.92	28.75
	Brands claiming			8.00	---	---	2.47	3.00	3.00	33.37
204	American Fertilizing Co., Norfolk, Va.	American Guano.	Wadesboro.	8.77	1.62	.78	2.40	2.92	3.31	35.40
2794	do.	J. G. Miller & Co.'s Yellow Leaf.	Nashville	8.45	2.00	.22	2.22	2.70	2.67	31.12
376	do.	do.	Wake Forest	7.86	1.54	.88	2.42	2.94	2.62	31.12
2792	do.	do.	Nashville	7.39	2.44	.10	2.54	3.09	2.58	30.96
341	American Agricultural Chemical Co., New York, N. Y.	Fish Brand Vance.	Henderson	8.37	1.42	1.42	2.84	3.45	3.03	35.45
2700	Armour Fertilizer Works, Wilmington, N. C.	Armour's No. 833 Fertilizer.	Richardson	8.19	1.26	1.08	2.34	2.84	3.02	33.12
2245	do.	do.	Patterson Springs	8.15	1.38	.98	2.36	2.87	3.01	33.11
2817	do.	Armour's Cotton Special Fertilizer.	Ivanhoe	8.10	1.88	.54	2.42	2.94	2.96	33.06
2026	do.	Armour's Tobacco Special Fertilizer.	Jamesville	8.14	1.20	1.34	2.54	3.09	3.03	33.96
315	do.	do.	Vineland	8.95	1.66	1.02	2.68	3.26	2.67	33.56
2816	do.	do.	Ivanhoe	8.50	1.38	.94	2.32	2.82	2.96	33.04
2875	Atlantic Chemical Corporation, Norfolk, Va.	Atlantic High Grade Tobacco Guano.	Arden	8.49	1.40	.90	2.30	2.82	4.70	41.65
2031	Berkley Chemical Co., Norfolk, Va.	Berkley Tobacco Guano.	Dunn	8.37	1.50	.82	2.32	2.80	2.92	32.71

429	.....do.....	.....do.....	Ayden.....	7.83	1.00	1.20	2.26	2.67	2.90	31.57
328	Baugh & Sons Co., Norfolk, Va.....	Baugh's Yucatan Special Tobacco Guano	Kinston.....	8.27	1.88	.66	2.54	3.09	3.24	35.14
2575	Brown, H. P., Guano Co., Salisbury, N. C.....	Brown's Tobacco Guano, High Grade.....	Cove City.....	7.22	1.48	.68	2.16	2.63	4.04	36.49
375	.....do.....	.....do.....	Henderson.....	8.62	1.04	1.08	2.12	2.58	2.55	30.27
2761	Carolina Union Fertilizer Co., Norfolk, Va.....	Carolina Union 3-8-3.....	Ahoscie.....	7.83	1.78	.64	2.42	2.94	2.84	32.19
261	Columbia Guano Co., Norfolk, Va.....	Columbia Hyco Tobacco Guano.....	Fremont.....	7.84	1.90	.80	2.70	3.28	2.96	33.98
2706	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers' Union 8-3-3 for Tobacco.....	Nashville.....	9.22	1.82	.44	2.26	2.75	2.96	33.51
2705	.....do.....	.....do.....	Nashville.....	9.63	1.58	.48	2.06	2.50	2.84	32.48
2426	.....do.....	Farmers' Union 8-3-3 Tobacco Guano.....	Wake Forest.....	8.01	.82	1.40	2.22	2.70	2.90	31.83
2833	.....do.....	.....do.....	Battleboro.....	7.97	.56	1.54	2.10	2.55	2.63	29.94
2960	.....do.....	.....do.....	Wilson.....	8.90	1.06	1.40	2.46	2.99	1.82	28.33
2750	Craven Chemical Co., New Bern, N. C.....	Craven Chemical Co.'s Tobacco Special.....	Trenton.....	8.80	.90	.96	1.86	2.26	1.78	25.51
2722	Farmers Cotton Oil Co., Wilson, N. C.....	Golden Gem.....	Sims.....	7.68	1.14	1.02	2.16	2.63	3.21	32.80
2747	Farmers' Union Guano Co., Statesville, N. C.....	Farmers' Union 8-3-3 Tobacco Guano.....	Trenton.....	8.15	1.14	1.08	2.22	2.70	2.30	28.97
2376	Meadows, E. H. & J. A., Co., New Bern, N.C.....	Meadows' Gold Leaf Tobacco Guano.....	New Bern.....	7.68	1.26	1.16	2.42	2.94	2.54	30.54
368	Navassa Guano Co., Wilmington, N. C.....	Clarendon Tobacco Guano.....	Vineland.....	9.12	1.80	.34	2.14	2.60	2.90	32.61
2786	N. C. Farmers' Union, Statesville, N. C.....	N. C. Farmers' Union Guano, No. 8-3-3.....	Nashville.....	7.47	1.64	.84	2.48	3.02	3.04	33.09
2360	.....do.....	N. C. Farmers' Union Tobacco Guano, No. 8-3-3.....	Charlotte.....	9.05	2.06	.36	2.42	2.94	2.47	31.56
2357	.....do.....	.....do.....	Trenton.....	8.91	2.24	.34	2.58	3.14	1.89	29.20
2798	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.....	Lenoir Bright Leaf Tobacco Grower.....	Trenton.....	8.07	1.16	1.74	2.90	3.53	3.37	37.10
481	.....do.....	.....do.....	Trenton.....	8.06	.80	1.76	2.56	3.11	3.43	35.96
2353	.....do.....	.....do.....	Trenton.....	7.57	.90	1.86	2.76	3.36	2.88	33.56
2769	.....do.....	.....do.....	Comfort.....	7.47	.96	1.82	2.78	3.38	2.75	32.90
2183	.....do.....	.....do.....	Fort Barnwell.....	8.65	.86	1.78	2.64	3.21	2.62	32.84
324	Ober, G., & Sons Co., Baltimore, Md.....	Royal Crown Tobacco Guano.....	Kinston.....	7.82	1.60	.90	2.50	3.04	3.36	35.12
2640	.....do.....	.....do.....	Fuquay Springs.....	7.94	1.04	.96	2.60	3.16	3.04	34.06

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
	Brands claiming			8.00	---	---	2.47	3.06	3.00	\$33.37
2006	Old Buck Guano Co., Richmond, Va.	Old Buck Quiney Tobacco and Garden Meal Body.	Williamston.	7.92	1.40	1.20	2.60	3.16	3.18	34.74
2370	Pamlico Chemical Co., Washington, N. C.	Pamlico Sweet Potato Guano.	Harbinger.	8.02	1.28	1.10	2.38	2.89	3.20	34.02
2745	do.	Tobacco Grower's Friend Guano.	Trenton.	7.90	1.32	1.30	2.62	3.19	3.05	34.15
477	do.	do.	Beaufort.	8.66	1.48	1.02	2.50	3.04	2.92	33.76
408	Patapsco Guano Co., Baltimore, Md.	Chippewa Guano.	Zebulon.	8.48	1.76	.70	2.46	2.99	2.76	32.61
2260	Pearsall & Co., Wilmington, N. C.	Pearsall's H. G. Guano.	Red Springs.	7.02	1.14	.98	2.12	2.58	3.02	35.22
2067	do.	do.	Red Springs.	8.26	1.00	1.14	2.14	2.60	3.26	32.94
2299	Peruvian Guano Corporation, Charleston, S. C.	Peruvian Mixture.	Battleboro.	8.35	1.28	.30	1.58	1.92	4.19	35.94
2301	Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.	Tar River Special.	Witakers.	8.94	.98	1.32	2.30	2.80	2.52	31.20
2371	Pocomoke Guano Co., Norfolk, Va.	Harvey's High Grade Monarch.	Jarvisburg.	7.92	1.72	.58	2.30	2.80	2.46	29.88
214	do.	Monarch Tobacco Grower.	Edenton.	7.53	1.44	1.18	2.62	3.19	2.68	31.93
2095	do.	do.	Pink Hill.	8.17	1.74	.68	2.42	2.94	2.55	31.08
321	Powhatan Chemical Co., Richmond, Va.	Powhatan Chemical Co.'s Hustler.	Kinston.	7.94	2.00	.46	2.46	2.99	3.25	34.52
529	do.	Powhatan Chemical Co.'s Hustler for Tobacco.	Wilson.	7.87	1.82	.70	2.52	3.06	2.58	31.35
2103	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bonanza Tobacco Guano.	Williamston.	7.70	1.44	1.00	2.44	2.97	3.29	34.40
280	do.	do.	Kinston.	7.83	1.76	.48	2.24	2.72	3.26	33.54
2101	do.	do.	Williamston.	8.97	.84	1.44	2.28	2.77	2.96	33.35

2184	do.	do.	Fort Barnwell	8.24	1.82	.64	2.46	2.99	2.95	33.32
2368	do.	do.	Mamie	7.59	1.46	.90	2.36	2.87	2.90	32.00
2247	Robeson Mfg. Co., Lumberton, N. C.	Silver Dollar	Hope Mills	7.99	2.24	1.18	3.42	4.16	2.93	37.00
2098	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Bonanza Tobacco Guano, F. S. R.	Cove City	7.96	1.76	.70	2.46	2.99	2.97	33.14
502	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Fertilizer, No. 833.	Gastonia	8.67	1.40	1.04	2.44	2.97	3.24	35.12
2940	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Tobacco Special	Lucama	8.20	1.00	1.56	2.56	3.11	2.64	32.15
320	Union Guano Co., Winston, N. C.	Victoria High Grade Tobacco Guano	Kinston	8.03	1.52	1.02	2.54	3.03	3.79	37.70
368	Swift & Co., Fertilizer Works, Wilmington, N. C.	Swift's Carolina Tobacco Grower High Grade Guano	Kittrell	9.03	1.22	1.02	2.24	2.72	2.65	31.74
2612	do.	Swift's Special Truck Grower High Grade 8-3-3.	Point Harbor	8.69	.50	.72	1.22	1.43	2.55	26.56
2763	Va.-Car. Chemical Co., Richmond, Va.	Davie & Whittles Owl Brand Tobacco	Trenton	8.67	1.18	.82	2.00	2.43	3.19	33.02
330	do.	Norfolk & Carolina Chemical Co.'s Amazon High Grade Special Guano, Owl Brand Guano for Tobacco C. S. M.	Littleton	8.42	2.30	.48	2.78	3.38	2.43	32.40
2099	do.	do.	Williamston	8.23	1.10	1.46	2.56	3.11	2.78	32.88
303	do.	V. C. C. Co.'s Menhaden Fish and Meal Mixture.	Mount Tabor	8.33	1.22	.91	2.16	2.63	2.90	31.95
2795	do.	V.-C. C. Co.'s Royal High Grade Fertilizer.	Trenton	7.01	1.06	1.02	2.03	2.53	2.75	29.50
Brands claiming										
2872	Marietta Fertilizer Co., Greensboro, N. C.	Marietta Fertilizer No. 835.	Kernersville	8.10	1.03	1.20	2.23	2.77	4.47	40.03
2030	Pearsall & Co., Wilmington, N. C.	Pearsall's High Grade Tobacco Guano	Clarkton	7.62	1.20	1.34	2.51	3.03	4.55	41.04
Brands claiming										
2830	Greenville Oil and Fertilizer Co., Greenville N. C.	8-4-½ Greenville Tobacco Grower	Greenville	7.42	.28	2.92	3.20	3.89	.71	24.41
2221	Farmville Oil and Fertilizer Co., Farmville, N. C.	Fish and Meal Special Formula	Farmville	8.59	1.86	1.48	3.34	4.06	.72	26.23
Brands claiming										
2441	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Special Fertilizer	Lucama	8.02	2.22	.70	2.92	3.55	1.02	25.38
2033	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 8-4-1	Marietta	9.00	2.04	1.10	3.14	3.82	1.28	28.59
2090	Eastern Cotton Oil Co., Hertford, N. C.	Mat White's Special for Corn and Cotton	Hertford	9.02	1.32	1.60	2.92	3.55	1.16	26.16
2107	Royster, F. S., Guano Co., Norfolk, Va.	Columbia Aurora Fertilizer	Roper	7.91	2.28	.90	3.18	3.87	1.28	27.67
2378	Union Seed and Fertilizer Co., Wilmington, N. C.	Brand No. 15.	Spring Hope	8.81	.60	2.66	3.26	3.96	.90	27.00

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brands claiming			8.00	---	---	3.29	4.00	1.00	\$26.82
2849	Union Seed and Fertilizer Co., Wilmington, N. C.	Brand No. 15	Kerr	9.06	.60	2.46	3.05	3.72	.86	26.21
2981	do	do	Maxton	8.31	.63	2.52	3.20	3.89	1.03	26.90
2979	do	do	Maxton	8.97	.56	2.54	3.10	3.77	.97	26.84
250	do	do	Parkton	8.66	.54	2.50	3.04	3.70	1.02	26.53
2848	do	do	Kerr	8.55	.44	2.76	3.20	3.89	.90	26.49
2978	do	do	Maxton	8.85	.50	2.66	3.16	3.84	.79	26.07
2980	do	do	Maxton	9.07	.42	2.56	2.98	3.62	.88	25.99
2984	do	do	Maxton	8.21	.42	2.66	3.08	3.74	.90	25.65
2983	do	do	Maxton	8.82	.42	2.70	3.12	3.79	.74	25.62
	Brands claiming			8.00	---	---	3.29	4.00	2.00	31.82
2401	Farmers Guano Co., Norfolk, Va.	Farmers' Trade Mark F. G. C., 8-4-2 Guano	Poplar Branch	8.59	2.72	.48	3.20	3.89	2.28	33.43
2975	Meadows, E. H. and J. A. Co., New Bern, N. C.	Meadows Ideal Compound	New Bern	7.82	2.30	.94	3.24	3.94	1.95	31.18
2923	do	do	Cove City	7.29	2.16	.98	3.14	3.82	1.91	30.03
2984	Palmetto Guano Corporation, Columbia, S. C.	Palmetto Tobacco Guano, 1917	Spring Hope	7.43	2.62	.82	3.44	4.18	1.90	31.38
476	Pamlico Chemical Co., Washington, N. C.	Royal Tobacco Guano	Wild Wood	8.01	2.60	.72	3.32	4.04	2.19	32.90
2215	Pocomoke Guano Co., Norfolk, Va.	Pocomoke 4-8-2 Fertilizer	Snow Hill	8.31	2.18	.90	3.08	3.74	1.78	30.35
2489	Southern Cotton Oil Co., Shelby, N. C.	S. C. O. Co.'s Ammoniated	Lawndale	9.04	1.22	1.84	3.06	3.72	2.44	34.09

2395	Upshur, R. L., Guano Co., Norfolk, Va.....	Upshur's for all Crops Trade Mark 8-4-2 Guano.	Aydlett.....	7.50	2.10	1.12	3.22	3.91	1.94	30.72
2165	-----do-----	do.....	Elizabeth City.....	7.65	2.14	1.08	3.22	3.91	1.80	30.17
434	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s Formula 101 for Tobacco.....	Greenville.....	7.55	2.46	.72	3.18	3.87	2.30	23.41
2305	-----do-----	V.-C. C. Co.'s Special Revised.....	Gibsonville.....	8.02	2.20	.34	2.54	3.09	3.78	37.59
	Brands claiming			8.00	-----	-----	4.11	5.00	1.00	30.26
228	Baugh & Sons Co., Norfolk, Va.....	Baugh's Peruvian Guano Substitute.....	Elizabeth City.....	9.14	3.13	.76	3.94	4.79	.96	30.49
290	Grandy, N. G., & Co., Elizabeth City, N. C.....	Grandy's 5-8-1 Fertilizer.....	Elizabeth City.....	8.03	3.64	.32	3.96	4.81	.97	29.51
436	Upshur, R. L., Guano Co., Norfolk, Va.....	Upshur's Trade Mark 8-5-1 Guano.....	Columbia.....	7.89	3.28	1.84	4.12	5.01	1.01	30.24
	Brands claiming			8.00	-----	-----	4.11	5.00	2.03	35.26
291	Grandy, N. G. & Co., Elizabeth City, N. C.....	Grandy's 5-8-2 Fertilizer.....	Elizabeth City.....	7.30	2.64	1.06	3.70	4.50	2.07	33.19
2393	Upshur, R. L., Guano Co., Norfolk, Va.....	Upshur's Fertilizer for all Crops.....	Harbinger.....	7.87	2.68	1.42	4.10	4.93	1.79	34.04
2646	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. C. Co.'s 8-5-2 Guano.....	Harbinger.....	8.57	2.36	1.16	3.52	4.28	2.19	34.32
	Brands claiming			8.00	-----	-----	4.11	5.00	3.00	40.26
467	Armour Fertilizer Works, Baltimore, Md.....	Armour's Fertilizer 8-5-3.....	Old Trap.....	7.63	2.72	1.32	4.04	4.91	3.43	41.75
227	Baugh & Sons Co., Norfolk, Va.....	Baugh's Tri-Unit Potato Guano.....	Elizabeth City.....	8.29	3.20	.70	3.90	4.74	3.21	40.72
299	Swift & Co., Fertilizer Works, Atlanta, Ga.....	Swift's Special Formula High Grade.....	Elizabeth City.....	7.28	1.88	2.16	4.04	4.91	2.40	36.25
2647	Upshur, R. L., Guano Co., Norfolk, Va.....	Upshur's 8-5-3 Guano.....	Curriuek C. H.....	7.87	3.32	.50	3.82	4.64	2.98	38.81
	Brand claiming			8.00	-----	-----	5.76	7.00	1.00	37.19
237	Pocomoke Guano Co., Norfolk, Va.....	Pocomoke 7-8-1 Fertilizer.....	Elizabeth City.....	8.05	1.80	2.32	4.12	5.01	1.69	33.80
	Brand claiming			8.50	-----	-----	2.06	2.50	2.00	26.23
2845	American Fertilizer Co., Norfolk, Va.....	American Blood and Bone Compound ..	Elizabeth City.....	9.12	1.28	.56	1.84	2.24	1.35	23.60
	Brand claiming			8.50	-----	-----	2.26	2.75	2.00	27.99
272	Va.-Car. Chemical Co., Richmond, Va.....	Allison & Addison's Anchor Brand Tobacco Fertilizer.....	Kenly.....	8.43	2.14	.32	2.46	2.99	1.94	28.46
	Brand claiming			9.00	-----	-----	.82	1.00	2.00	22.44
115	Georgia Chemical Works, Augusta, Ga.....	Georgia Bell Compound.....	Asheboro.....	9.86	.35	.54	.89	1.08	1.78	22.50

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MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brand claiming			9.00	---	---	1.15	1.40	2.00	\$23.83
365	Union Guano Co., Winston-Salem, N. C.	Union Perfect Cotton Grover	Williamston	9.42	.76	1.42	2.18	2.65	2.01	28.78
	Brands claiming			9.00	---	---	1.65	2.00	1.00	20.93
2921	American Agricultural Chemical Co., New York, N. Y.	Canton Chemical Co.'s Fish Mixture	Burlington	9.99	1.04	.58	1.62	1.97	.90	21.29
2485	do.	do.	Murfreesboro	9.32	.62	.86	1.48	1.80	1.01	20.59
2010	do.	Detrick's Ammoniated Superphosphate with Potash	Wilcox	9.06	1.18	.52	1.70	2.07	1.11	21.75
224	Baugh & Sons Co., Norfolk, Va.	Baugh's Animal Base Potash Compound	Edenton	8.57	1.24	.78	2.02	2.46	1.27	23.40
2918	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Complete Fertilizer	Burlington	8.99	1.14	.64	1.78	2.16	1.70	19.97
211	Navassa Guano Co., Wilmington, N. C.	Navassa Complete Fertilizer	Newton Grove	10.05	1.30	.38	1.63	2.01	1.05	22.36
2243	do.	do.	Lawndale	10.49	.94	.72	1.66	2.02	.74	21.16
2591	N. C. Farmers' Union, Statesville, N. C.	N. C. Farmers' Union Guano 9-3-1	Stoneville	8.89	.50	.98	1.43	1.80	.88	19.51
2589	Old Buck Guano Co., Richmond, Va.	Old Buck Minorca Guano	Walnut Cove	9.28	.84	.78	1.62	1.97	.84	20.28
2738	Reidsville Fertilizer Co., Reidsville, N. C.	Reidsville Big Crop Guano	Burch	9.55	1.18	.28	1.48	1.78	1.03	20.83
2863	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Honey Bee Special Compound	Toecane	10.65	.82	.74	1.55	1.89	1.00	21.80
503	do.	do.	Mourée	9.46	1.22	.38	1.60	1.94	1.06	21.48
2299	Tennessee Chemical Co., Greensboro, N. C.	Ox Fertilizer 9-2-1	Mount Airy	8.47	.54	1.03	1.62	1.97	1.08	20.67
542	Va-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Guano	Madison	10.43	1.16	.52	1.68	2.04	1.47	24.84

2731	---do.---	Old Dominion Guano Co.'s Standard Raw Bone Guano.	Elkin.....	10.57	1.34	.26	1.60	1.94	1.12	22.89
	Brands claiming			9.00	---	---	1.65	2.09	2.00	25.93
2778	American Fertilizing Co., Norfolk, Va.	American Special Mixture.....	Taylorsville.....	9.98	.80	.36	1.16	1.41	1.60	22.85
2806	Pocahontas Guano Co., Inc., Lynchburg, Va.	Yellow Tobacco.....	Mebane.....	9.12	1.14	.54	1.63	2.04	1.70	24.68
	Brands claiming			9.00	---	---	1.85	2.25	2.03	26.77
2211	Norfolk Fertilizing Co., Norfolk, Va.	Oriana 2 1/4-9-2 Fertilizer.....	Pinnacle.....	9.38	1.03	.78	1.86	2.26	1.76	25.99
2128	Pocomoke Guano Co., Norfolk, Va.	Pocomoke Monticello Animal Bone Special.	Robersonville.....	9.39	.90	1.12	2.02	2.46	1.44	25.07
	Brands claiming			9.00	---	---	1.65	2.00	3.00	30.93
2888	Clayton Oil Mills, Clayton, N. C.	Barbour's Crop Grower.....	Clayton.....	8.74	.20	1.30	1.50	1.82	2.73	28.69
2365	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Viking Ammoniated Guano.....	Pineville.....	9.12	.98	.64	1.62	1.97	3.20	31.92
	Brands claiming			9.00	---	---	2.03	2.50	2.00	27.86
2742	Patapsco Guano Co., Baltimore, Md.	Patapsco Guano.....	Huntersville.....	9.34	1.38	.64	2.02	2.46	2.13	23.47
	Brands claiming			9.00	---	---	2.26	2.75	.50	20.99
2028	Union Seed and Fertilizer Co., Wilmington, N. C.	U. S. and F. Co.'s Brand No. 3.....	Marietta.....	10.00	.62	1.43	2.10	2.25	.73	22.47
2377	---do.---	do.....	Nashville.....	9.89	.63	1.38	2.03	2.50	.50	21.04
	Brands claiming			9.00	---	---	2.26	2.75	2.00	28.49
2673	Acme Mfg. Co., Wilmington, N. C.	Acme Tobacco Grower.....	Nashville.....	7.72	1.16	1.10	2.26	2.75	2.02	27.31
2791	American Fertilizing Co., Norfolk, Va.	Pelican Crop Grower.....	Nashville.....	8.74	1.64	.28	1.92	2.32	2.01	26.85
2024	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Tobacco and Cotton Grower.....	Williamston.....	9.49	1.38	1.18	2.56	3.11	1.76	29.04
2020	Columbia Guano Co., Norfolk, Va.	Columbia C. S. M. Special.....	Jamesville.....	9.08	.82	1.38	2.20	2.67	1.83	27.72
2789	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 9-23-2 Tobacco.....	Emery Siding.....	8.75	.76	1.44	2.20	2.67	2.67	31.34
2711	---do.---	do.....	Nashville.....	9.12	1.16	1.03	2.24	2.72	2.11	29.08
2707	---do.---	do.....	Nashville.....	9.83	1.70	.52	2.22	2.70	1.88	28.55
2714	---do.---	do.....	Nashville.....	9.19	1.72	.56	2.28	2.77	1.76	27.57
2886	Craven Chemical Co., New Bern, N. C.	Craven Chemical Co.'s Proficient Cottonseed Meal.	Clayton.....	9.40	1.46	.76	2.22	2.70	2.20	29.73
2388	Greenville Oil and Fertilizer Co., Greenville, N. C.	Special Meal Mixture.....	Spring Hope.....	9.07	.92	1.32	2.26	2.75	1.93	28.21

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	
	Brands claiming			9.00			2.26	2.75	2.00
265	Harris Coöperative Co., Wilson, N. C.	Harris Meal Mixture	Wilson	9.12	1.08	1.44	2.52	3.06	2.36
531	do.	do.	Wilson	8.42	.60	1.52	2.12	2.58	1.73
197	Navassa Guano Co., Wilmington, N. C.	Manipulated Guano	Nashville	9.98	1.32	.90	2.22	2.70	2.12
2007	Old Buck Guano Co., Richmond, Va.	Old Buck Advance Tobacco Meal Body	Williamston	8.86	1.12	1.18	2.30	2.80	2.26
537	Pamlico Chemical Co., Washington, N. C.	Pamlico Meal Mixture	Washington	9.37	1.08	1.26	2.34	2.84	1.95
2665	Rasin-Monumental Co., Baltimore, Md.	Rasin Dixie Tobacco Guano	Nashville	9.19	.54	1.46	2.00	2.43	2.67
2353	do.	do.	Nashville	9.52	.86	1.26	2.12	2.58	2.32
2783	do.	do.	Nashville	8.95	2.22	.04	2.26	2.78	2.23
2781	do.	do.	Nashville	8.44	1.48	.68	2.16	2.63	2.20
245	do.	do.	Nashville	8.40	.90	1.30	2.20	2.67	2.13
243	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Meal Mixture, F. S. R.	Rocky Mount	9.52	.74	1.42	2.16	2.63	1.98
2824	do.	do.	Rocky Mount	8.92	.72	1.48	2.20	2.67	2.05
2104	do.	do.	Williamston	8.82	.78	1.50	2.28	2.77	1.92
241	Southern Cotton Oil Co., Rocky Mount, N. C.	Goldsboro Cotton Grower C. S. M.	Rocky Mount	7.51	.58	1.68	2.26	2.75	2.14
2942	Southern Cotton Oil Co., Goldsboro, N. C.	do.	Lucama	9.99	.64	1.20	1.84	2.24	1.87
2599	do.	do.	Wilson	8.66	.84	1.12	1.96	2.38	1.91
2891	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special Tobacco, High Grade	Williamston	8.69	.62	1.76	2.38	2.89	1.94

2330	Union Guano Co., Winston-Salem, N. C.	Union Perfect Cotton Grower	Elm City	9.06	.60	1.74	2.31	2.84	2.12	29.49
2036	Va.-Car. Chemical Co., Richmond, Va.	Allison & Addison's Star Brand Special Tobacco Manure.	Marietta	9.97	1.76	.54	2.30	2.80	1.95	29.38
238	do	Prolific Cotton Grower C. S. M.	Rocky Mount	9.59	1.24	.96	2.20	2.67	2.06	29.13
196	do	do	Goldsboro	9.45	.70	1.52	2.22	2.70	2.22	28.27
2780	do	do	Weston	9.87	.52	1.36	1.83	2.24	1.90	27.27
239	do	Standard Cotton Grower	Nashville	8.41	.83	1.32	2.20	2.67	2.23	28.80
2062	do	White Stem C. S. M.	Williamston	8.77	.91	1.40	2.31	2.81	2.14	29.40
2100	do	do	Williamston	9.44	.78	1.60	2.33	2.80	1.94	29.14
Brands claiming										
1527	Union Seed and Fertilizer Co., Wilmington, N. C.	U. S. & F. Co., Brand No. 4	Kerr	10.01	2.20	.10	2.30	2.80	.55	22.45
2927	Union Seed and Fertilizer Co., Raleigh, N. C.	do	Lucama	9.22	.86	1.50	2.33	2.87	.64	22.33
Brands claiming										
2452	American Agricultural Chemical Co., New York, N. Y.	Detrick's K. K. K. Kangaroo Complete Compound.	St. Paul	9.67	1.42	1.18	2.60	3.16	1.12	26.19
2467	do	do	St. Paul	9.59	1.12	1.40	2.52	3.06	1.03	25.32
2402	Farmers Guano Co., Norfolk, Va.	Farmers' 9-3-1 Guano	Poplar Branch	8.95	1.90	.76	2.66	3.23	1.22	26.22
2170	do	do	South Mills	8.44	1.51	1.02	2.56	3.11	1.15	24.94
2616	Grandy, N. G. & Co., Elizabeth City, N. C.	Grandy's 3-9-1 Fertilizer	Elizabeth City	10.49	2.84	.24	3.03	3.74	.98	23.33
Brands claiming										
496	American Agricultural Chemical Co., New York, N. Y.	Ellis Brand 9-3-2	Henderson	9.35	1.38	1.14	2.52	3.06	2.02	30.03
2910	do	Gold Eagle Tobacco Fertilizer	Creedmoor	8.88	1.63	.92	2.60	3.16	2.01	29.85
248	do	Vance's Best Grade Tobacco Manure	Spring Hope	9.20	1.50	1.03	2.53	3.14	2.63	33.19
548	Patapsco Guano Co., Baltimore, Md.	Patapsco Tobacco Fertilizer	Pilot Mountain	9.74	1.86	.52	2.38	2.83	1.91	29.29
544	Royster, F. S., Guano Co., Norfolk, Va.	Pilot Mountain Special Tobacco Guano	Pilot Mountain	9.24	1.58	.63	2.23	2.75	1.95	28.43
Brand claiming										
2793	American Fertilizer Co., Norfolk, Va.	Special Formula Guano for Yellow Leaf Tobacco.	Nashville	9.03	1.32	.51	1.83	2.26	2.09	27.34

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory	
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash		
19	Brand claiming			10.00				.20	.24	2.00	\$20.84
	Armour Fertilizer Works, Greensboro, N. C.	Armour's Special Grain Fertilizer	Candler	10.25	.19	.22		.41	.50	1.79	20.92
2874	Brands claiming			10.00				.82	1.00	1.00	18.44
	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Hoe Cake Fertilizer	Tocane	9.63	.38	.58	.96	1.17	1.02	1.02	18.76
458	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Plow Boy Standard Grade Guano	Kings Mountain	9.74	.48	.44	.92	1.12	1.02	1.02	18.70
2735	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Fertilizer No. 1011	Rockford	10.15	.38	.50	.88	1.07	.83	1.00	18.00
2905	Brands claiming			10.00				1.65	2.00	2.00	26.93
	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Eagle High Grade Guano	Lyons	10.00	.94	.60	1.54	1.87	1.75	1.75	25.22
2902	do.	do.	Stem	9.02	.88	.60	1.48	1.80	1.80	24.24	
2366	Brand claiming			10.00				1.65	2.00	3.00	31.93
	Rock Hill Fertilizer Co., Rock Hill, S. C.	Piedmont High Grade Fertilizer	Pineville	10.59	.24	1.46	1.70	2.07	3.12	3.12	33.33
2600	Brand claiming			10.09				2.47	3.00	1.00	25.37
	Powhatan Chemical Co., Richmond, Va.	Special Fertilizer	Wilson	10.15	1.06	1.30	2.36	2.87	1.00	25.06	
2218	Brand claiming			7.00				4.11	5.00	2.00	34.26
	Meadows, E. H. and J. A. Co., New Bern, N. C.	Meadows Potato Compound	New Bern	7.77	1.30	1.66	2.96	3.60	1.45	27.45	
301	Pamlico Chemical Co., Washington, N. C.	Pamlico Potato Guano	Elizabeth City	6.81	3.18	.96	4.11	5.03	2.18	35.10	
355	Pocomoke Guano Co., Norfolk, Va.	Pocomoke 5-7-2 Fertilizer	Jarvisburg	7.07	2.94	1.20	4.14	5.03	1.98	34.36	
296	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Southern Trucker High Grade 7-5-2	Elizabeth City	5.97	1.00	3.40	4.40	5.35	1.74	33.15	

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	
	Brand claiming			3.00	—	—	7.38	8.97	1.00 \$39.00
1696	Chesapeake Chemical Co., Baltimore, Md.	Top Dresser Fertilizer	Raleigh	3.45	—	—	8.18	9.95	1.27 44.16
	Brand claiming			1.00	—	—	10.70	13.01	45.94
2694	Conestee Chemical Co., Wilmington, N. C.	Dried Ground Fish	Tar Heel	1.04	1.96	7.66	9.62	11.70	41.44
	Brand claiming			3.90	—	—	7.40	9.00	34.03
2538	Acme Mfg. Co., Wilmington, N. C.	Acme 3-9-0 Top Dresser	Lumberton	3.32	6.04	.88	6.92	8.41	32.38
2928	Rasin-Monumental Co., Baltimore, Md.	Rasin Top Dresser	Aycock Crossing	5.10	7.28	.08	7.36	8.95	36.01
2881	Robeson Mfg. Co., Lumberton, N. C.	Robeson Mfg. Co.'s Top Dresser	St. Paul	3.28	5.44	.90	6.34	7.71	29.91
2885	do.	do.	St. Paul	4.45	4.88	.66	5.54	6.74	27.72
2983	Union Seed and Fertilizer Co., Wilmington, N. C.	Wilmington Top Dresser	Warsaw	3.64	6.40	.88	7.28	8.85	34.22
2986	do.	do.	Warsaw	3.47	5.90	.96	6.86	8.34	32.28
	Brands claiming			4.00	—	—	8.23	10.00	38.57
2810	Navassa Guano Co., Wilmington, N. C.	Navassa Ammoniated Superphosphate	Clinton	4.78	7.86	.48	8.34	10.14	39.81
2337	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 10% Tankage	Fayetteville	3.82	.74	6.36	7.10	8.63	33.64
	Brand claiming			4.00	—	—	9.05	11.00	42.01
2145	Navassa Guano Co., Wilmington, N. C.	Navassa Dry Fish	Robersonville	4.85	.02	9.22	9.24	11.23	43.66
	Brands claiming			5.00	—	—	8.23	10.00	39.57
2994	Baugh & Sons Co., Philadelphia, Pa.	Baugh's New Process 10%	Manchester	5.90	7.22	.04	7.26	8.83	36.39

2450	Bowker Fertilizer Co., New York, N. Y.	Bowker 10-5-0 Fertilizer	St. Paul	5.50	6.92	1.42	8.34	10.14	-----	40.53
	Brand claiming									
2593	Home Fertilizer and Chemical Co., Baltimore, Md.	Cerealite Top Dressing	Williamston				7.42	9.02	3.00	46.16
	Brands claiming									
2560	Acme Mfg. Co., Wilmington, N. C.	Acme 6-4-0 Special Fertilizer	Kerr	6.00			3.29	4.00	-----	19.32
2993	do	do	Lumber Bridge	7.05	2.28	1.72	4.00	4.86	-----	23.85
2561	do	do	Fayetteville	6.05	2.56	.84	3.40	4.13	-----	20.33
2991	do	do	Lumber Bridge	7.03	1.92	1.22	3.14	3.82	-----	20.22
2859	do	do	Kerr	5.82	2.48	.92	3.40	4.13	-----	20.10
2257	do	do	Hope Mills	6.67	1.70	1.46	3.16	3.84	-----	19.94
2280	do	do	Hope Mills	6.19	1.62	1.50	3.12	3.79	-----	19.29
2263	do	do	Hope Mills	5.58	1.70	1.50	3.20	3.89	-----	18.99
2456	do	do	Lena	5.98	1.52	1.60	3.12	3.79	-----	18.98
2698	do	do	Fayetteville	6.62	1.64	1.23	2.86	3.44	-----	18.63
2990	do	do	Lumber Bridge	6.93	1.64	1.10	2.74	3.33	-----	18.44
317	do	do	Fairmont	5.84	1.56	1.42	2.98	3.62	-----	18.36
2674	do	do	Nashville	5.98	1.62	1.18	2.80	3.40	-----	17.74
2537	American Fertilizing Co., Norfolk, Va.	American 6 and 4 Ammoniated Com-pound	Parkton	6.52	1.12	1.44	2.55	3.11	-----	17.27
2289	do	do	Wagram	6.44	2.90	.52	3.42	4.16	-----	20.80
2073	American Agricultural Chemical Co., New York, N. Y.	Carolina Formula	Hope Mills	7.19	2.54	.40	2.94	3.67	-----	19.54
2048	do	do	St. Paul	6.22	3.30	.84	4.14	5.03	-----	23.61
2261	do	do	Hope Mills	6.24	1.98	1.24	3.22	3.91	-----	19.76
2074	do	do	Hope Mills	6.35	2.22	.86	3.08	3.74	-----	19.29
2639	do	do	White Oak	6.10	2.36	.74	3.10	3.77	-----	19.12
2256	do	do	Hope Mills	6.60	1.72	1.26	2.98	3.62	-----	19.12
2072	do	do	Hope Mills	6.37	2.24	.78	3.02	3.67	-----	19.05
	do	do	Hope Mills	6.07	2.28	.80	3.08	3.74	-----	19.01

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
Brands claiming										
2432	Armour Fertilizer Works, Wilmington, N. C.	Armour's Ammoniated Superphosphate.	Lena.	6.00	2.14	1.18	3.29	4.00		\$19.82
2815	do.	do.	Ivanhoe.	5.53	1.84	1.18	3.32	4.04		19.47
2079	Berkley Chemical Co., Norfolk, Va.	Berkley 4-6-0 Fertilizer.	Dunn.	6.53	2.40	.86	3.26	3.96		19.21
2686	Bowker Fertilizer Co., New York, N. Y.	Bowkers 4-6-0 Fertilizer.	White Oak.	6.12	2.40	.74	3.24	3.94		19.77
2075	do.	do.	Hope Mills.	7.32	2.50	.74	3.24	3.94		20.93
468	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Pride.	Windsor.	6.69	2.18	.90	3.08	3.74		19.63
207	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer's Co.'s 6-4-0.	Laurinburg.	6.09	2.90	.48	3.38	4.11		20.29
2727	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 6-4-0 Ammoniated Compound.	Nashville.	5.67	1.74	1.20	2.94	3.57		18.02
2032	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 6-4 Ammoniated Phosphate.	Marietta.	8.20	1.72	.80	2.52	3.06		18.78
2193	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co.'s 6-4-0 Fertilizer.	Fayetteville.	7.22	1.42	1.76	3.18	3.87		20.58
430	Columbia Guano Co., Norfolk, Va.	Columbia Battery Ammoniated Phosphate.	Ayden.	6.39	2.26	.76	3.02	3.70		19.07
2035	Conestee Chemical Co., Wilmington, N. C.	Conestee 6-4-0 Fertilizer.	Marietta.	6.11	2.16	.98	3.14	3.82		19.33
2118	do.	do.	Morven.	6.10	1.78	1.14	2.92	3.55		18.36
2347	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 6-4-0 Ammoniated Compound.	Red Springs.	6.31	1.66	1.16	2.82	3.43		18.15
439	Eastern Cotton Oil Co., Hertford, N. C.	O. W. C. Special.	Columbia.	5.80	1.48	1.48	2.96	3.60		18.23
2091	do.	Winslow's Special.	Moyock.	5.57	.98	1.84	2.82	3.43		17.41
2201	Farmers Guano Co., Raleigh, N. C.	6-4 Ammoniated Phosphate.	Red Springs.	6.40	1.68	1.06	2.74	3.33		18.10
				6.54	2.76	.60	3.36	4.09		20.65

515	Hubbard Fertilizer Co., Baltimore, Md.....	Hubbard 4-6-0 Fertilizer.....	Whitakers.....	6.04	.42	2.88	3.30	4.01	19.90
255	Imperial Co., Norfolk, Va.....	Imperial 4-6-0 Fertilizer.....	Parkton.....	7.03	2.56	.88	3.44	4.13	21.48
2534	do.....	do.....	Parkton.....	7.30	1.00	2.20	3.20	3.89	20.74
2345	do.....	do.....	Red Springs.....	6.02	2.24	.88	3.12	3.79	19.12
2146	Josey, N. B., Co., Tarboro, N. C.....	Josey's 6-4-0 Fish Scrap.....	Bethel.....	6.14	1.76	1.18	2.94	3.57	18.49
2191	McNair Phosphate Co., Laurinburg, N. C.....	6-4 Ammoniated Guano.....	Fayetteville.....	6.88	1.90	.90	2.80	3.40	18.64
2286	Norfolk Fertilizing Co., Norfolk, Va.....	Oriana 4-6-0 Fertilizer.....	Red Springs.....	6.70	2.42	.80	3.22	3.93	20.22
2344	do.....	do.....	Fayetteville.....	7.14	1.70	1.40	3.10	3.77	20.16
2431	do.....	do.....	Lena.....	6.30	1.70	1.56	3.26	3.96	19.99
2284	do.....	do.....	Red Springs.....	5.48	2.10	1.14	3.24	3.91	19.09
2190	do.....	do.....	Fayetteville.....	6.29	2.56	.40	2.96	3.60	18.70
2287	do.....	do.....	Red Springs.....	6.38	2.12	.72	2.84	3.45	18.31
2254	Pamlico Chemical Co., Washington, N. C.....	Pamlico Fish Compound.....	Hope Mills.....	5.82	2.40	.70	3.10	3.77	18.84
2220	Palapasco Guano Co., Baltimore, Md.....	Old North State Mixture.....	Snow Hill.....	6.55	1.50	1.68	3.18	3.87	19.91
2137	Pocomoke Guano Co., Norfolk, Va.....	Pocomoke 4-6-0 Fertilizer.....	Robersonville.....	6.19	.94	2.08	3.02	3.67	18.87
400	Read Phosphate Co., Charleston, S. C.....	Read's Blood and Bone Mixture.....	Wadesboro.....	6.59	1.68	1.12	2.80	3.40	18.35
2661	Richmond Guano Co., Richmond, Va.....	Rex Tobacco Guano.....	Nashville.....	6.50	1.68	1.34	3.02	3.67	19.18
2966	Robertson Fertilizer Co., Norfolk, Va.....	Robertson's 4-6 Guano.....	Fayetteville.....	6.68	2.74	.40	3.14	3.82	19.87
2187	do.....	do.....	Fayetteville.....	5.89	.74	2.34	3.08	3.74	18.83
2880	Robeson Mfg. Co., Lumberton, N. C.....	R. M. C., 6-4.....	Lumberton.....	6.85	1.92	1.88	3.80	4.62	22.81
2989	do.....	do.....	Hope Mills.....	6.54	2.16	.88	3.04	3.70	19.31
2541	do.....	do.....	Lumberton.....	6.69	1.06	1.78	2.84	3.45	18.62
2549	do.....	do.....	Lumberton.....	6.47	1.26	1.60	2.86	3.48	18.48
2548	do.....	do.....	Lumberton.....	6.70	.94	1.82	2.76	3.36	18.29
2546	do.....	do.....	Lumberton.....	6.86	1.16	1.54	2.70	3.28	18.20
2463	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Flagstaff Ammoniated Phosphate.....	Fayetteville.....	5.99	2.30	.96	3.26	3.96	19.68

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MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
Brands claiming										
2458	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Ammoniated Superphosphate.	Stedman	6.00	1.70	1.76	3.29	4.00		\$19.82
2013	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s Alliance Ammoniated Compound.	Greenville	6.92	2.44	.56	3.46	4.21		21.45
2115	do	V.-C. C. Co.'s N. C. Ammoniated Compound.	McFarlan	6.72	2.94	.34	3.00	3.65		19.32
2258	do	6-4 Ammoniated Compound	Hope Mills	6.24	2.66	.50	3.28	3.99		20.02
2195	do	V.-C. Ammoniated Compound	Red Springs	6.38	2.16	.88	3.16	3.84		19.65
Brands claiming										
2092	Columbia Guano Co., Norfolk, Va.	Columbia Coblin Ammoniated Phosphate	Elizabeth City	6.00	3.18	.74	3.92	4.77		23.26
350	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Tulip 5% Ammoniated Phosphate.	Powells Point	6.33	2.82	1.14	4.11	5.00		22.96
225	Va.-Car. Chemical Co., Richmond, Va.	V.-C. C. Co.'s 6-5-0 Ammoniated Superphate.	Elizabeth City	6.00	3.60	1.22	3.96	4.81		23.98
Brands claiming										
362	Farmers Guano Co., Norfolk, Va.	Farmers' Guano Co., 6-7 Ammoniated Phosphate.	Poplar Branch	6.78	3.18		5.76	7.00		30.19
2054	Robertson Fertilizer Co., Norfolk, Va.	Robertson's 7-6 Guano.	Bethel	6.00	3.34	2.24	5.58	6.78		29.44
234	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Trucking Compound High Grade 6-7-0	Elizabeth City	6.18	3.32	2.10	5.42	6.59		28.94
293	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's for all Crops.	Elizabeth City	5.81	2.50	3.14	5.64	6.86		29.50
Brands claiming										
2657	Aeme Mfg. Co., Wilmington, N. C.	Aeme 7-5-0 Fertilizer	Fayetteville	5.89	3.36	2.36	5.72	6.95		29.91
do	do	do	Fayetteville	7.00			4.11	5.00		24.26
				7.11	2.44	1.32	3.76	4.57		22.90
				7.46	2.14	1.46	3.60	4.38		22.58

2697	do.	do.	do.	Tar Heel	7.65	2.26	1.20	3.46	4.21	22.18
2701	American Agricultural Chemical Co., New York, N. Y.	Detrick's 5-7-0 Fertilizer	do.	Tar Heel	7.74	2.16	1.64	3.80	4.62	23.70
289	Imperial Company, Norfolk, Va.	Imperial 5-7-0 Fertilizer	do.	Elizabeth City	7.32	2.32	1.02	3.84	4.67	23.45
2892	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's 7-5-0 Fish Scrap Guano	do.	Williamston	7.19	1.98	1.80	3.78	4.60	23.07
2017	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Virginia Potato Grower, High Grade.	do.	Elizabeth City	7.00	1.96	2.06	4.02	4.89	23.88
	Brand claiming				7.00			4.95	6.00	27.79
221	Va.-Car. Chemical Co., Richmond, Va.	V.-C. Co.'s 7-6-0 Ammoniated Superphosphate.	do.	Washington	7.03	3.56	.88	4.44	5.40	25.78
	Brand claiming				7.00			5.76	7.00	31.19
539	Meadows, E. H. & J. A. Co., New Bern, N. C.	Meadows' Great Cabbage Grower	do.	Vanceboro	7.15	1.94	2.12	4.06	4.94	24.20
	Brands claiming				7.50			3.70	4.50	23.04
2044	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh Special Ammoniated Phosphate.	do.	Red Springs	8.96	1.06	2.54	3.60	4.38	24.08
2046	do.	do.	do.	Red Springs	8.86	.92	2.48	3.40	4.13	23.14
	Brands claiming				8.00			2.47	3.00	18.37
327	Baugh & Sons Co., Norfolk, Va.	Baugh's Non-potash Mixture	do.	Kinston	9.04	1.46	.92	2.38	2.89	19.04
2572	Georgia Chemical Works, Augusta, Ga.	Georgia Special 9-3-0 Superphosphate.	do.	Cove City	7.54	1.12	1.80	2.92	3.55	19.80
487	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Onslow Crop Grower	do.	Newport	8.85	.62	1.80	2.42	2.95	19.01
2405	Scotland Neck Guano Co., Scotland Neck, N. C.	Biggs 8-3-0	do.	Cove City	8.37	1.42	1.16	2.58	3.14	19.21
232	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special "A" Low Grade 8-3-0	do.	Elizabeth City	9.12	.86	1.40	2.26	2.75	18.61
	Brand claiming				8.00			2.67	3.25	19.21
2150	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Special Ammoniated Phosphate.	do.	Fayetteville	8.44	1.32	1.78	3.10	3.77	21.46
	Brands claiming				8.00			3.29	4.00	21.82
2291	Acme Mfg. Co., Wilmington, N. C.	Acme 8-4-0 Special Fertilizer	do.	Hope Mills	8.06	1.84	1.34	3.18	3.87	21.42
2728	do.	do.	do.	Nashville	7.99	1.84	1.18	3.02	3.67	20.67
2436	do.	do.	do.	Lena	7.13	1.80	1.54	3.34	4.06	21.16
442	do.	do.	do.	Clarkton	8.20	1.40	1.52	2.92	4.77	20.46
2453	do.	do.	do.	St. Paul	8.31	1.64	1.28	2.92	4.77	20.57

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brands claiming			8.00	-----	-----	3.29	4.00	-----	\$21.82
2455	Acme Mfg. Co., Wilmington, N. C.	Acme 8-4-0 Special Fertilizer	Lena	8.09	1.98	.78	2.76	3.36	-----	19.68
202	do.	do.	Goldsboro	8.09	1.22	1.48	2.70	3.28	-----	19.43
2274	American Agricultural Chemical Co., New York, N. Y.	Ammoniated Fertilizer	Absotie	7.97	2.38	1.02	3.40	4.13	-----	22.25
411	do.	do.	Zebulon	8.01	2.32	.96	3.28	3.99	-----	21.79
2045	do.	do.	St. Paul	8.06	2.24	.92	3.16	3.84	-----	21.33
2160	American Fertilizing Co., Norfolk, Va.	American 8 and 4 Ammoniated Compound.	Duke	8.41	2.62	.82	3.44	4.18	-----	22.86
2155	do.	do.	Dunn	8.35	2.54	.72	3.26	3.96	-----	22.04
2818	do.	do.	Dunn	8.00	2.80	.52	3.32	4.04	-----	21.94
183	do.	do.	Dunn	8.10	2.27	.86	3.13	3.81	-----	21.25
2973	do.	do.	Fayetteville	7.19	2.44	.84	3.28	3.99	-----	20.97
443	do.	do.	Wadesboro	8.94	2.18	.64	2.82	3.43	-----	20.78
348	do.	do.	Wadesboro	8.59	1.94	.66	2.60	3.16	-----	19.51
2348	do.	American Brand 4 Ammonia Compound	Fayetteville	8.84	2.08	.82	2.90	3.53	-----	21.02
2154	Armour Fertilizer Works, Wilmington, N. C.	Armour's Ammoniated Superphosphate.	Fayetteville	8.44	1.88	1.54	3.42	4.16	-----	22.80
2278	do.	do.	St. Paul	8.40	1.82	1.36	3.18	3.87	-----	21.76
2336	do.	do.	Parkton	8.62	1.66	1.46	3.12	3.79	-----	21.72
2349	do.	do.	Fayetteville	8.36	1.70	1.44	3.14	3.82	-----	21.55

2485	Arps, George L., & Co., Norfolk, Va.....	Arps' Quickstep Brand.....	Rich Square.....	7.92	2.28	.96	3.24	3.94	-----	21.53
2264	Atlantic Chemical Corporation, Norfolk, Va....	Atlantic Seco Ammoniated.....	Ahoskie.....	7.91	2.22	.80	3.02	3.67	-----	20.59
329	Baugh & Sons Co., Norfolk, Va.....	Baugh's Nitrophos Soil and Crop Fer- tilizer.....	Kinston.....	8.84	2.22	1.08	3.30	4.01	-----	22.70
486	-----do.....	-----do.....	Newport.....	8.47	2.24	1.00	3.24	3.94	-----	22.08
2049	-----do.....	-----do.....	Robersonville.....	7.92	2.46	.84	3.30	4.01	-----	21.78
2056	-----do.....	-----do.....	Fayetteville.....	8.38	2.52	.66	3.18	3.87	-----	21.74
2512	-----do.....	-----do.....	Cove City.....	8.51	2.50	.64	3.14	3.82	-----	21.70
2480	-----do.....	-----do.....	Grifton.....	8.20	2.34	.86	3.20	3.89	-----	21.64
2080	Berkley Chemical Co., Norfolk, Va.....	Berkley 4-8-0 Fertilizer.....	Dunn.....	8.64	2.34	.86	3.20	3.89	-----	22.08
2451	Bowker Fertilizer Co., New York, N. Y.....	Bowker's 4-8-0 Fertilizer.....	St. Paul.....	7.95	2.16	1.04	3.20	3.89	-----	21.39
469	Burton, C. J., Guano Co., Baltimore, Md.....	Burton's Ammoniated Bone Phosphate.....	Windsor.....	7.83	2.94	.54	3.48	4.23	-----	22.45
2643	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Caraleigh 8-4 Ammoniated Phosphate.....	Fayetteville.....	8.39	.98	2.26	3.24	3.94	-----	22.00
2151	-----do.....	-----do.....	Carvers Falls.....	8.60	.88	2.12	3.06	3.72	-----	21.45
2002	-----do.....	-----do.....	Wilson.....	9.03	1.42	1.30	2.72	3.31	-----	20.45
326	Columbia Guano Co., Norfolk, Va.....	Columbia Big Dipper Ammoniated Phos- phate.....	Kinston.....	8.05	2.34	1.02	3.36	4.09	-----	22.16
259	Coe-Mortimer Co., Charleston, S. C.....	Coe-Mortimer Co.'s 8-4-0 Fertilizer.....	Parkton.....	7.90	2.02	1.04	3.06	3.72	-----	20.75
2440	Conestee Chemical Co., Wilmington, N. C.....	Conestee 8-4-0 Special Fertilizer.....	Kenly.....	7.37	2.36	.98	3.34	4.06	-----	21.40
2328	Contentnea Guano Co., Wilson, N. C.....	Climax Cotton Grower.....	Cove City.....	8.35	1.74	1.42	3.16	3.84	-----	21.62
410	-----do.....	Climax Special.....	Black Creek.....	6.91	1.90	1.40	3.30	4.01	-----	20.77
262	-----do.....	Plant Bed Special.....	Fremont.....	7.83	1.44	1.66	3.10	3.77	-----	20.85
2709	Coöperative Warehouse Co., Salisbury, N. C....	Farmers' Union 8-4-0 Ammoniated Com- pound.....	Nashville.....	8.82	1.94	.86	2.80	3.40	-----	20.58
2749	Craven Chemical Co., New Bern, N. C.....	Craven Chemical Co.'s Ammoniated Compound, 8-4-0.....	Trenton.....	8.82	4.36	.24	4.60	5.59	-----	23.14
2751	-----do.....	-----do.....	Trenton.....	8.75	2.78	.24	3.02	3.67	-----	21.43
2754	-----do.....	-----do.....	Trenton.....	8.33	1.60	1.38	2.98	3.62	-----	20.85
2753	-----do.....	-----do.....	Trenton.....	8.12	1.70	1.12	2.82	3.43	-----	19.96
2760	Dixie Guano Co., Suffolk, Va.....	Dixie 4-8 Guano.....	Hobbsville.....	8.62	2.18	.92	3.10	3.77	-----	21.64

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Total Potash	Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		
	Brands claiming			8.00			3.29	4.00		\$21.82
2199	Farmers Guano Co., Raleigh, N. C.	F. G. C. 8-4 Ammoniated Phosphate	Red Springs	10.02	1.82	1.26	3.08	3.74		22.96
2200	do.	do.	Red Springs	10.36	1.88	1.06	2.94	3.67		22.71
2996	Georgia Chemical Works, Augusta, Ga.	Cardinal Ammoniated Compound	Lumber Bridge	7.97	2.70	.94	2.94	3.67		20.32
2071	do.	do.	Lumber Bridge	8.12	2.50	.38	2.88	3.50		20.20
2327	do.	Georgia Special 8-4-0 Superphosphate	Cove City	8.39	2.92	.40	3.32	4.04		22.33
2325	do.	do.	Cove City	8.67	2.78	.46	3.24	3.94		22.28
2511	do.	do.	Cove City	8.50	2.88	.16	3.04	3.70		21.27
2525	do.	do.	Cove City	8.58	2.84	.32	3.16	3.84		21.85
2415	do.	do.	Cove City	8.63	2.62	.20	2.82	3.43		20.47
287	do.	do.	Kinston	8.75	2.42	.36	2.78	3.38		20.43
2508	do.	do.	Cove City	8.56	2.64	.16	2.80	3.40		20.32
2573	do.	do.	Cove City	9.19	1.72	.92	2.64	3.21		20.28
2509	do.	do.	Cove City	8.57	2.74	.00	2.74	3.33		20.08
2524	do.	do.	Cove City	10.57	1.16	1.12	2.28	2.77		20.05
2269	Hampton Guano Co., Norfolk, Va.	Hampton 4-8-0 Fertilizer	Absokie	8.60	1.96	.94	2.90	3.53		20.78
532	Harris Coöperative Co., Wilson, N. C.	Harris Big Yield Guano	Wilson	7.90	2.36	1.02	3.38	4.11		22.10
2302	Hubbard Fertilizer Co., Baltimore, Md.	Hubbard's 8-4-0 Fertilizer	Halifax	8.42	2.10	.90	3.00	3.65		21.02

2693	Imperial Company, Norfolk, Va.	Imperial 4-8-0 Fertilizer	White Oak	7.87	2.60	.84	3.24	3.94	21.48
2533	do.	do.	Parkton	8.05	2.06	1.12	3.18	3.87	21.40
2692	do.	Imperial Fertilizer	Populi	7.77	2.26	.88	3.14	3.82	20.95
2031	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's 8-4-0 Fish Scrap Guano	Bethel	7.74	1.82	1.48	3.30	4.01	21.60
286	do.	do.	Tarboro	7.57	1.34	1.80	3.12	3.79	20.67
2124	Martin Fertilizer Co., Norfolk, Va.	Martin's Ammoniated Compound	Dunn	8.80	2.30	.86	3.16	3.84	22.07
347	Maybank Fertilizer Co., Charleston, S. C.	Maybank Ammoniated Superphosphate	Vineland	8.22	2.78	.64	3.42	4.16	22.58
2040	McCabe Fertilizer Co., Charleston, S. C.	McCabe's Special No. 3	Red Springs	8.92	1.90	1.38	3.28	3.99	22.70
206	McNair Phosphate Co., Laurinburg, N. C.	8-4 Ammoniated	Maxton	8.47	1.96	1.08	3.04	3.70	21.24
2642	do.	do.	Wakulla	9.00	1.82	.76	2.58	3.14	19.84
2570	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Ideal Special Tobacco	Cove City	9.55	2.50	.50	3.00	3.65	22.15
2409	do.	do.	Cove City	8.05	1.34	1.86	3.20	3.89	21.49
2320	do.	do.	Cove City	9.52	1.18	1.66	2.84	3.45	21.45
2412	do.	do.	Cove City	8.02	1.52	1.64	3.16	3.84	21.29
2318	do.	do.	Cove City	7.69	1.52	1.70	3.22	3.91	21.21
2316	do.	do.	Cove City	7.70	1.48	1.72	3.20	3.89	21.14
2623	do.	do.	Cove City	6.76	1.58	1.82	3.40	4.13	21.04
2324	do.	do.	Cove City	7.42	1.52	1.72	3.24	3.94	21.03
2319	do.	do.	Cove City	7.46	1.48	1.74	3.22	3.91	20.98
2506	do.	do.	Cove City	7.94	1.56	1.54	3.10	3.77	20.96
2317	do.	do.	Cove City	7.74	1.42	1.66	3.08	3.74	20.68
2411	do.	do.	Cove City	7.38	1.70	1.32	3.02	3.67	20.06
2519	do.	do.	Cove City	7.70	1.32	1.52	2.84	3.45	19.63
2322	do.	do.	Cove City	7.66	1.36	1.48	2.84	3.45	19.59
2414	do.	do.	Cove City	7.40	1.38	1.50	2.88	3.50	19.50
2321	do.	do.	Cove City	7.86	1.44	1.30	2.74	3.33	19.37

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brands claiming			8.00	---	---	3.29	4.00	---	\$21.82
2025	Meadows, E. H. & J. A. Co., New Bern, N. C.	Meadows' Ideal Special Tobacco	Cove City	7.76	1.54	1.22	2.76	3.36	---	19.35
2520	do	do	Cove City	7.89	1.48	1.24	2.72	3.31	---	19.31
2517	do	do	Cove City	7.10	1.82	1.08	2.90	3.53	---	19.28
2522	do	do	Cove City	7.82	1.48	1.24	2.72	3.31	---	19.24
2047	do	do	Cove City	7.30	1.18	1.56	2.74	3.33	---	18.81
2569	do	do	Cove City	8.46	1.46	1.00	2.46	2.99	---	18.79
2567	do	do	Cove City	8.12	1.42	1.12	2.54	3.09	---	18.79
2083	Navassa Guano Co., Wilmington, N. C.	Navassa High Grade Ammoniated Superphosphate.	Lena	9.65	2.36	.78	3.14	3.82	---	22.84
210	do	do	Newton Grove	9.46	2.28	.44	2.72	3.31	---	20.88
2476	do	do	Grifton	8.05	2.02	1.02	3.04	3.70	---	20.82
2785	N. C. Farmers' Union, Statesville, N. C.	N. C. Farmers' Union Ammoniated Superphosphate.	Nashville	7.81	2.40	.90	3.30	4.01	---	21.67
2579	do	do	Trenton	8.72	2.78	.24	3.02	3.67	---	21.40
3085	do	do	White Oak	8.50	2.32	.62	2.94	3.57	---	20.87
2495	do	N. C. Farmers' Union Guano, 8-4-0	Lawndale	9.15	1.66	.94	2.60	3.16	---	20.07
2583	do	N. C. Farmers' Union Tobacco Guano	Trenton	8.67	2.62	.22	2.84	3.45	---	20.60
2555	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Standard Crop Grower	Trenton	8.29	1.08	2.04	3.12	3.79	---	21.39
2181	do	do	Fort Barnwell	8.49	.86	2.06	2.92	3.55	---	20.75

2684	Norfolk Fertilizing Co., Norfolk, Va.	Oriana 4-8-0 Fertilizer	Cedar Creek	7.87	2.52	.74	3.26	3.96	21.56
2811	do	do	Fayetteville	7.41	2.48	.82	3.30	4.01	21.27
2343	do	do	Fayetteville	8.06	1.90	1.22	3.12	3.79	21.16
2285	do	do	Red Springs	7.80	2.38	.68	3.06	3.72	20.65
2858	Ober, G., & Sons Co., Baltimore, Md.	Trade Mark Ideal Vegetable Compound	Kerr	8.03	1.76	1.46	3.22	3.91	21.55
2266	Old Buck Guano Co., Richmond, Va.	Old Buck 4% Compound	Ahoskie	7.96	2.44	.90	3.34	4.06	21.99
480	Pamlico Chemical Co., Washington, N. C.	Pamlico Acid Fish Mixture Guano	Trenton	8.05	2.26	1.00	3.26	3.96	21.74
2447	do	do	St. Paul	8.31	2.38	.78	3.16	3.84	21.58
2474	do	do	Grifton	7.94	2.28	.92	3.20	3.89	21.38
2168	do	do	Elizabeth City	8.52	2.18	.86	3.04	3.70	21.29
2680	Pearsall & Co., Wilmington, N. C.	Pearsall's Bone, Meal, and Fish Guano	Cedar Creek	8.04	1.54	1.72	3.26	3.96	21.73
2189	do	do	Fayetteville	8.03	2.10	1.14	3.24	3.94	21.64
2065	do	do	Linden	8.05	1.50	1.70	3.20	3.89	21.49
2068	do	do	Red Springs	8.71	1.20	1.84	3.04	3.70	21.48
2679	do	do	Elease	8.42	1.42	1.66	3.08	3.74	21.36
2338	do	do	Red Springs	7.88	1.44	1.74	3.18	3.87	21.24
2069	do	do	Linden	7.85	1.56	1.60	3.16	3.84	21.12
2340	do	do	Red Springs	8.40	1.00	2.02	3.02	3.67	21.08
2852	do	do	Kerr	8.60	1.28	1.60	2.88	3.50	20.70
2856	do	do	Kerr	8.38	1.12	1.68	2.80	3.40	20.14
2339	do	do	Red Springs	7.95	.24	2.60	2.84	3.45	19.88
2066	do	do	Red Springs	6.24	1.20	1.94	3.14	3.82	19.43
2954	do	do	Red Springs	6.87	1.00	1.92	2.92	3.55	19.13
314	Peruvian Guano Corporation, Charleston, S. C.	Peruvian Sea Island Ammonia Superphosphate.	Fairmont	6.96	2.52	.40	2.92	3.55	19.22
2233	Piedmont Mount Airy Guano Co., Baltimore, Md.	Piedmont Special Fertilizer	Sunbury	8.03	2.04	1.08	3.12	3.79	21.13
520	Pine Level Oil Mill Co., Pine Level, N. C.	Panacea Guano	Benson	7.57	2.02	1.22	3.24	3.94	21.18

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
	Brands claiming								
511	Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.	Meal and Fish Mixture No. 2.....	Whitakers.....	8.00	1.52	1.42	2.94	3.57	20.59
2421	Planters Fertilizer and Phosphate Co., Charleston, S. C.	Planters' Special Mixture.....	Lilesville.....	8.01	1.80	1.56	3.36	4.09	22.12
2076	Pocomoke Guano Co., Norfolk, Va.....	Pocomoke 4-8-0 Fertilizer.....	Hope Mills.....	8.23	2.06	1.02	3.08	3.74	21.17
2826	Rasin Monumental Co., Baltimore, Md.....	Rasin Capital Monumental Phosphate.....	Nashville.....	8.67	2.92	.28	3.20	3.89	22.11
2668	do.....	do.....	Nashville.....	7.07	2.64	.68	3.32	4.04	21.01
2543	Robeson Manufacturing Co., Lumberton, N. C.	R. M. C. Blood.....	Lumberton.....	8.53	1.32	1.92	3.24	3.94	22.14
2252	do.....	R. M. C. 8-4.....	Hope Mills.....	7.97	1.76	1.44	3.20	3.89	21.41
2445	do.....	do.....	St. Paul.....	8.06	2.56	1.60	3.16	3.84	21.33
2550	do.....	do.....	Lumberton.....	8.37	1.82	1.26	3.08	3.74	21.31
2542	do.....	do.....	Lumberton.....	8.20	1.72	1.26	2.98	3.62	20.70
2248	do.....	do.....	Hope Mills.....	7.42	1.36	1.66	3.02	3.67	20.10
2547	do.....	do.....	Lumberton.....	8.47	1.48	1.24	2.72	3.31	19.89
2544	do.....	do.....	Lumberton.....	8.20	1.30	1.42	2.72	3.31	19.62
2545	do.....	do.....	Lumberton.....	7.74	1.06	1.64	2.70	3.28	19.09
2249	do.....	do.....	Hope Mills.....	8.04	1.44	1.32	2.76	3.36	19.63
2336	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Defender Ammoniated Phosphate.....	Fayetteville.....	8.24	2.58	1.00	3.58	4.35	23.28
2121	do.....	do.....	Dunn.....	8.08	2.50	.96	3.46	4.21	22.61

2330	do.	do.	Fayetteville	7.99	2.58	.88	3.46	4.21	22.52
2408	do.	do.	Cove City	7.87	2.42	1.02	3.44	4.18	22.32
2314	do.	do.	Cove City	8.00	2.32	1.08	3.40	4.13	22.28
2408	do.	do.	Cove City	8.14	2.38	.98	3.36	4.09	22.25
2003	do.	do.	Robersonville	8.09	2.38	.98	3.36	4.09	22.20
433	do.	do.	Greenville	7.98	2.32	1.06	3.38	4.11	22.18
2462	do.	do.	Fayetteville	8.02	2.42	.94	3.36	4.09	22.13
2419	do.	do.	Lilesville	8.30	2.28	1.00	3.28	3.99	22.08
2406	do.	do.	Cove City	7.89	2.28	1.08	3.36	4.09	22.00
2516	do.	do.	Cove City	8.06	2.30	.98	3.28	3.99	21.84
2513	do.	do.	Cove City	8.00	2.32	.96	3.28	3.99	21.78
2068	do.	do.	Fayetteville	8.10	2.58	.66	3.28	3.99	21.71
2514	do.	do.	Cove City	8.14	2.06	1.12	3.18	3.87	21.50
2067	do.	do.	Fayetteville	7.99	2.48	.70	3.18	3.87	21.35
2501	do.	do.	Cove City	7.96	2.38	.78	3.16	3.84	21.23
2505	do.	do.	Cove City	8.05	2.32	.80	3.12	3.79	21.15
2502	Royster, F. S., Guano Co., Norfolk, Va.	Roysters' Defender Ammoniated F. S. R.	Cove City	7.87	2.32	.82	3.14	3.82	21.06
2396	do.	do.	Aydlett	7.79	2.16	.94	3.10	3.77	20.81
2500	do.	do.	Cove City	7.82	2.36	.72	3.08	3.74	20.76
2620	do.	do.	Cove City	7.96	2.30	.74	3.04	3.70	20.73
2585	do.	do.	Cove City	7.82	2.34	.72	3.06	3.72	20.67
2504	do.	do.	Cove City	8.03	2.22	.78	3.00	3.65	20.63
2429	Southern Cotton Oil Co., Fayetteville, N. C.	Soco Ammoniated Compound	Elease	8.53	1.96	1.12	3.08	3.74	21.47
2428	do.	do.	Lena	8.02	2.10	1.00	3.10	3.77	21.04
2970	do.	do.	Vander	7.58	2.26	.92	3.18	3.87	20.94
2690	do.	do.	White Oak	7.85	1.92	1.06	2.98	3.62	20.37

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
Brands claiming										
2309	Southern Cotton Oil Co., Fayetteville, N. C.	Soco Ammoniated Compound	Fayetteville	8.06	1.76	1.10	2.86	4.00	3.29	\$21.82
2678	do	do	White Oak	8.17	1.80	1.08	2.88	3.50		20.18
2808	do	do	Dunn	7.82	1.80	1.08	2.88	3.50		19.92
2653	do	do	Vander	7.65	1.82	1.06	2.88	3.50		19.75
2555	do	do	Hope Mills	7.64	1.70	1.10	2.80	3.40		19.74
2998	do	do	Fayetteville	7.87	1.80	1.02	2.82	3.43		19.63
2950	do	do	Vander	7.71	1.68	1.00	2.68	3.26		19.55
2952	do	do	Elcase	8.19	1.68	1.04	2.72	3.31		19.45
2556	do	do	Fayetteville	8.02	1.52	1.16	2.68	3.26		19.44
2558	do	do	Fayetteville	7.81	1.66	1.22	2.68	3.26		19.07
2652	do	do	Vander	7.74	1.78	.96	2.74	3.33		19.00
2677	do	do	Elcase	7.15	1.54	1.00	2.54	3.09		18.66
2964	do	do	Lucama	7.95	1.76	.86	2.62	3.19		18.62
2296	do	do	Whitakers	9.20	1.36	1.44	2.80	3.40		20.20
2055	do	do	Robersonville	8.10	1.26	1.56	2.82	3.43		19.86
242	do	do	Enfield	7.80	1.56	1.40	2.96	3.60		19.44
2437	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Ammoniated Phosphate	Lucama	7.94	1.88	1.36	3.24	3.94		20.37
				8.20						21.81

2238	do.	Swift's Animal Matter Ammoniated Fertilizer.	Charlotte.	7.55	1.10	2.18	3.28	3.99	21.33
298	do.	Swift's Special Formula A. High Grade 8-4-0.	Elizabeth City.	6.95	1.68	1.64	3.32	4.04	20.89
2553	Tuscarora Fertilizer Co., Wilmington, N. C.	Tuscarora Ammoniated Superphosphate.	Fayetteville.	7.48	1.68	1.48	3.16	3.84	20.75
509	Union Guano Co., Winston-Salem, N. C.	Union Special 8-4-0 Ammoniated Superphosphate.	Halifax.	8.95	2.30	.70	3.00	3.65	21.55
2842	do.	do.	Williamston.	8.02	2.44	.72	3.16	3.84	21.29
319	do.	do.	Kinston.	8.27	2.70	.28	2.98	3.62	20.79
2675	do.	do.	White Oak.	8.43	2.30	.42	2.72	3.31	19.85
2987	Union Seed and Fertilizer Co., Wilmington, N. C.	Union Seed and Fertilizer Co., No. 13.	Warsaw.	8.40	.86	2.24	3.10	3.77	21.42
305	do.	do.	Chadbourn.	7.96	1.66	1.16	2.82	3.43	19.80
2483	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's 8-4 Ammoniated Phosphate.	Murfreesboro.	8.69	2.34	1.02	3.36	4.09	22.80
2977	Va-Car. Chemical Co., Richmond, Va.	V-C. C. Co.'s 8-4-0 Ammoniated Compound.	Hope Mills.	8.97	2.06	1.16	3.22	3.91	22.49
523	do.	do.	Rocky Mount.	8.64	2.48	.50	2.98	3.62	21.16
2926	do.	do.	Lucama.	8.13	1.86	1.14	3.00	3.65	20.73
394	do.	do.	Wadesboro.	9.36	2.56	.14	2.70	3.28	20.70
2162	do.	V-C. Bone and Fish Ammoniated Compound.	Weeksville.	7.19	2.84	.62	3.46	4.21	21.72
2472	do.	do.	Grifton.	8.00	2.26	.90	3.16	3.84	21.27
2527	do.	do.	Hope Mills.	7.50	2.86	.28	3.14	3.82	20.69
2294	do.	Mann's Fish and Meal Compound.	Whitakers.	8.38	2.02	1.14	3.16	3.84	21.65
2224	Winborne Guano Co., Baltimore, Md.	Special Triumph Guano.	Edenton.	8.10	1.26	2.06	3.32	4.04	22.04
Brands claiming.				8.00			4.11	5.00	25.26
2094	Armour Fertilizer Works, Baltimore, Md.	Armour's Ammoniated Superphosphate.	Elizabeth City.	7.71	2.52	1.42	3.94	4.79	24.26
2403	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Soil and Crop Fertilizer.	Elizabeth City.	8.25	3.26	.80	4.06	4.94	25.30
226	Eastern Cotton Oil Co., Hertford, N. C.	Our Surprise.	Elizabeth City.	8.19	1.16	2.58	3.74	4.55	23.90
2400	Farmers Guano Co., Norfolk, Va.	Farmers' Trade Mark F. C. 8-5 Ammoniated Phosphate.	Poplar Branch.	8.22	2.52	1.52	4.04	4.91	25.19
254	Josey, N. B., Guano Co., Tarboro, N. C.	Josey's 8-5-0 Fish Scrap Guano.	Fayetteville.	8.15	1.96	1.78	3.74	4.55	23.86
2417	Meadows, E. H. & J. A., New Bern, N. C.	Meadows' LaBos Tobacco Grover.	Cove City.	7.85	2.40	1.66	4.06	4.94	24.90

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
Brands claiming										
2413	Meadows, E. H. & J. A., Newbern, N. C.	Meadows' LaBos Tobacco Grower	Cove City	8.00	2.22	1.66	3.88	4.72	5.00	\$25.26
2518	do	do	Cove City	7.65	1.48	2.40	3.84	4.67		23.95
2418	do	do	Cove City	7.69	2.42	1.34	3.76	4.57		23.82
2626	do	do	Cove City	7.84	2.16	1.58	3.74	4.55		23.63
2369	Pamlico Chemical Co., Washington, N. C.	Pamlico Tip Top Potato Guano	Edenton	6.91	2.94	1.06	4.00	4.86		22.62
2758	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Challenge Fertilizer	Hobbsville	7.94	2.32	1.54	3.86	4.69		24.74
2087	Pocomoke Guano Co., Norfolk, Va.	Pocomoke 5-8-0 Fertilizer	Moyock	8.10	2.86	1.12	3.98	4.84		24.31
233	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special Truck Fertilizer, High Grade 8-5-0	Elizabeth City	8.20	2.86	1.12	3.88	4.72		24.92
279	Upton, L. J., & Co., Norfolk, Va.	Upton's Special Fertilizer, Revised	Bayboro	7.94	1.70	2.18	4.06	4.94		24.24
2628	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's 8-5 Ammoniated Phosphate	Elizabeth City	7.37	2.78	1.28	3.94	4.79		24.42
223	Va.-Car. Chemical Co., Richmond, Va.	V.-C. 8-5-0 Ammoniated Superphosphate	Washington	8.41	2.72	1.22	4.02	4.89		24.96
Brands claiming										
2234	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Special Potato Guano, Revised 1916	Sunbury	7.70	3.34	.68	5.76	7.00		24.58
2086	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Alaska 7% Ammoniated	Maple	8.00			5.76	7.00		32.19
364	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Top Dresser Formula No. 1, High Grade	Harbinger	7.75	3.88	1.82	5.70	6.93		31.69
229	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's for All Crops 8-7 Ammoniated Phosphate	Elizabeth City	9.90	3.90	1.78	5.68	6.91		33.76
2164	Upton, L. J., & Co., Norfolk, Va.	Upton's Truck Guano	Camden	7.82	2.12	3.28	5.40	6.57		30.50
			Elizabeth City	7.50	4.12	1.74	5.86	7.12		32.11
			Camden	7.54	3.94	1.54	5.48	6.66		30.56

Brands claiming			9.00	2.47	3.00	19.37			
2699	Acme Mfg. Co., Wilmington, N. C.	Acme 9-3-0 Special Fertilizer.	White Oak	1.40	1.38	2.78	21.77		
2838	do.	do.	Williamston	7.55	2.02	1.06	3.08	3.74	20.49
2434	do.	do.	Elease	8.22	1.66	1.26	2.92	3.55	20.48
2992	do.	do.	Lumber Bridge	8.72	1.72	.96	2.68	3.26	19.98
2539	do.	do.	Lumberton	9.39	.86	1.64	2.50	3.04	19.89
2454	do.	do.	Lena	8.99	1.08	1.46	2.54	3.09	19.66
2435	do.	do.	Lena	9.18	1.04	1.46	2.50	3.04	19.68
550	do.	do.	Pilot Mountain	8.90	1.36	1.16	2.52	3.06	19.48
2279	do.	do.	Hope Mills	9.00	1.04	1.36	2.40	2.93	19.08
2644	do.	do.	Wakulla	9.17	1.00	1.24	2.24	2.72	18.58
208	do.	do.	Maxton	8.72	1.14	1.38	2.52	3.06	19.30
337	American Agricultural Chemical Co., New York, N. Y.	No. 1 Ammoniated Fertilizer, Vance	Henderson	8.93	1.78	.70	2.48	3.02	19.35
2152	American Fertilizing Co., Norfolk, Va.	American 9 and 3 Ammoniated Com-pound.	Dunn	9.73	2.32	.38	2.70	3.28	21.07
2897	do.	do.	Charlotte	10.45	1.78	.48	2.26	2.75	19.94
2131	do.	do.	Dunn	9.19	1.58	.98	2.56	3.11	19.94
2133	do.	do.	Dunn	11.12	1.32	.70	2.02	2.46	19.70
2158	do.	do.	Dunn	9.13	1.74	.74	2.48	3.02	19.15
2820	do.	do.	Dunn	9.19	1.48	.76	2.24	2.72	18.60
2132	do.	do.	Dunn	8.70	1.58	.62	2.20	2.67	17.94
2469	do.	do.	Fayetteville	9.19	1.54	.48	2.02	2.46	17.67
2995	do.	do.	Manchester	9.32	1.26	.68	1.94	2.36	17.47
2433	Armour Fertilizer Works, Wilmington, N. C.	Armour's Ammoniated Superphosphate Fertilizer.	Lena	9.47	1.22	1.30	2.52	3.06	20.05
441	do.	do.	Clarkton	8.90	1.42	.94	2.36	2.87	18.81
2660	do.	do.	Fayetteville	8.89	1.32	1.00	2.32	2.82	18.63
2894	do.	do.	Old Trap	8.69	.88	1.26	2.14	2.60	17.68

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphate	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
	Brands claiming			9.00	---	---	2.47	3.00	---	\$19.37
2487	Arps, George L., & Co., Norfolk, Va.	Arps' Acid Phosphate and Ammonia Mixture.	Rich Square.	9.10	1.70	.84	2.54	3.09	---	19.77
2273	Atlantic Chemical Corporation, Norfolk, Va.	Atlantic Orlando.	Aboskie.	8.41	1.66	.74	2.40	2.92	---	18.49
2078	Berkley Chemical Co., Norfolk, Va.	Berkley 3-9-0 Fertilizer.	Dunn.	8.44	1.84	.70	2.54	3.09	---	19.11
2130	do.	do.	Newton Grove.	8.60	1.62	.78	2.40	2.92	---	18.68
2917	Bryant Fertilizer Co., Alexandria, Va.	Bryant's Standard Ammoniated Super-phosphate.	Burlington.	6.89	2.18	.48	2.66	3.23	---	18.06
453	Burton, C. J., Guano Co., Baltimore, Md.	Burton's Ammoniated Phosphate.	Greensboro.	8.18	1.96	.70	2.66	3.23	---	19.35
2723	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co.'s 9-3-0 Fertilizer.	Sims.	9.02	1.62	.78	2.40	2.92	---	19.10
260	do.	Coe-Mortimer Co.'s Fish Mixture.	Parkton.	9.52	1.80	.64	2.44	2.97	---	19.78
2153	do.	do.	Duke.	8.14	1.62	.70	2.32	2.82	---	17.88
471	Columbia Guano Co., Norfolk, Va.	Columbia Congress Ammoniated Phosphate.	Warrenton.	8.82	1.70	.84	2.54	3.09	---	19.49
2127	Coweta Fertilizer Co., Newnan, Ga.	Coweta 9 and 3 Ammonia Compound.	Dunn.	8.46	1.66	.84	2.50	3.04	---	19.96
2152	do.	do.	Dunn.	8.52	2.02	.70	2.72	3.31	---	19.94
2129	do.	do.	Dunn.	7.82	2.18	.60	2.78	3.38	---	19.50
2937	Contentnea Guano Co., Wilson, N. C.	Special Cotton Grower.	Lucama.	8.06	1.40	.98	2.38	2.89	---	18.06
2805	Craven Chemical Co., New Bern, N. C.	Craven Chemical Co.'s Ammoniated Compound.	Trenton.	8.90	1.64	.60	2.24	2.72	---	18.31
263	do.	do.	Trenton.	8.82	1.32	.84	2.16	2.63	---	17.89
2043	Farmers Fertilizer Works, Spartanburg, S. C.	Red Rooster Fertilizer.	Red Springs.	9.25	1.78	.76	2.54	3.09	---	19.92

2552	Georgia Chemical Works, Augusta, Ga.....	Georgia Special 9-3-0 Superphosphate.....	Cove City.....	9.11	2.60	.50	3.10	3.77	22.13
2615	Grandy, N. G., & Co., Elizabeth City, N. C....	Grandy's 3-9-0 Fertilizer.....	Elizabeth City.....	9.50	1.98	.88	2.86	3.48	21.61
267	Harris Cooperative Co., Wilson, N. C.....	Harris Special Guano.....	Wilson.....	8.81	2.12	.78	2.90	3.53	20.99
2271	Hampton Guano Co., Norfolk, Va.....	Hampton 3-9-0 Fertilizer.....	Ahoskie.....	8.64	1.74	.76	2.50	3.04	19.14
461	International Agricultural Corporation, Spar- tanburg, S. C.....	Ammoniated Compound.....	Kings Mountain.....	8.91	1.32	1.30	2.62	3.19	19.91
253	Josey, N. B., Guano Co., Tarboro, N. C.....	Josey's 9-3-0.....	Fayetteville.....	8.69	1.28	1.51	2.82	3.43	20.53
2147	do.....	do.....	Robersonville.....	8.07	1.66	.94	2.60	3.16	18.99
2123	Martin, D. B., Co., Norfolk, Va.....	Martin's Ammoniated Compound.....	Dunn.....	9.67	1.41	.74	2.18	2.65	18.83
2149	do.....	do.....	Dunn.....	10.02	1.42	.88	2.30	2.80	19.08
530	do.....	do.....	Wilson.....	9.06	1.58	.90	2.48	3.02	19.48
2459	McNair Phosphate Co., Laurinburg, N. C.....	9-3 Ammoniated Guano.....	Fayetteville.....	9.07	1.50	.62	2.12	2.58	17.97
2374	Meadows, E. H. & J. A. Co., New Bern, N. C.	Meadows' Gold Leaf Special Tobacco.....	New Bern.....	8.79	1.70	1.32	3.02	3.67	21.47
2521	do.....	do.....	Cove City.....	8.89	1.04	1.42	2.46	2.99	19.22
2410	do.....	do.....	Cove City.....	8.59	1.08	1.28	2.36	2.87	18.50
2315	do.....	do.....	Cove City.....	7.47	1.12	1.38	2.50	3.04	17.97
2507	do.....	do.....	Cove City.....	8.61	1.02	1.10	2.12	2.58	17.51
2141	Navassa Guano Co., Wilmington, N. C.....	Navassa Standard Ammoniated Super- phosphate.....	Robersonville.....	9.24	2.10	.50	2.60	3.16	20.16
2985	do.....	do.....	Roseboro.....	9.49	1.72	.68	2.40	2.92	19.57
310	do.....	do.....	Vineland.....	9.40	1.86	.56	2.42	2.94	19.56
2767	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.....	Onslow Crop Grower.....	Trenton.....	8.20	1.00	2.04	3.04	3.70	20.97
2008	do.....	do.....	Robersonville.....	8.87	.76	1.82	2.58	3.14	19.71
2786	do.....	do.....	Trenton.....	9.06	.68	1.60	2.28	2.77	18.64
2342	Norfolk Fertilizing Co., Norfolk, Va.....	Oriana 3-9-0 Fertilizer.....	Fayetteville.....	8.80	1.72	.96	2.68	3.26	20.06
2267	Old Buck Guano Co., Richmond, Va.....	Old Buck Nine-Three.....	Ahoskie.....	8.69	1.74	.78	2.52	3.06	19.27
2169	Pamlico Chemical Co., Washington, N. C.....	Pamlico Rank Guano.....	Elizabeth City.....	9.03	1.60	.74	2.34	2.84	18.86
475	Patapsco Guano Co., Baltimore, Md.....	Patapsco Guano Co.'s 9-3-0 Fertilizer.....	Warrenton.....	9.13	1.62	.82	2.48	3.02	19.55

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
	Brands claiming			9.00	-----	-----	2.47	3.60	-----	\$19.37
2387	Patapasco Guano Co., Baltimore, Md.	Patapasco Fish Mixture.....	Elm City.....	9.62	1.82	.74	2.56	3.11	-----	20.37
2614	Peruvian Guano Corporation, Charleston, S. C.	Peruvian Excelsior Ammoniated Super-phosphate.	Scotland Neck.....	9.57	1.34	1.00	2.34	2.84	-----	19.40
313	do.....	do.....	Fairmont.....	8.99	1.70	.40	2.10	2.55	-----	17.81
2227	Piedmont-Mount Airy Guano Co., Baltimore, Md.	Piedmont Cotton Grower.....	Edenton.....	8.94	1.64	.86	2.50	3.04	-----	19.44
2139	Pocomoke Guano Co., Norfolk, Va.....	Pocomoke 3-9-0 Fertilizer.....	Robersonville.....	8.71	.64	1.46	2.10	2.55	-----	17.53
528	Powhatan Chemical Co., Richmond, Va.....	Hustler Guano.....	Wilson.....	8.97	1.20	1.28	2.48	3.02	-----	19.37
2250	Robeson Mfg. Co., Lumberton, N. C.....	R. M. C. 9-3.....	Hope Mills.....	8.57	1.20	1.30	2.50	3.04	-----	19.07
2953	do.....	do.....	Hope Mills.....	8.95	1.46	.90	2.36	2.87	-----	18.56
343	do.....	do.....	Fayetteville.....	8.02	1.52	.92	2.44	2.97	-----	18.27
2959	do.....	do.....	Hope Mills.....	8.42	1.02	1.22	2.24	2.72	-----	17.83
2883	do.....	do.....	Lumberton.....	8.24	1.04	1.24	2.28	2.77	-----	17.82
2882	do.....	do.....	St. Paul.....	8.71	1.26	.90	2.16	2.63	-----	17.78
2884	do.....	do.....	St. Paul.....	8.65	1.32	.80	2.12	2.58	-----	17.55
2251	do.....	do.....	Hope Mills.....	8.08	1.08	1.16	2.24	2.72	-----	17.49
2566	Royster, F. S., Guano Co., Norfolk, Va.....	Simplex Ammoniated Phosphate.....	Cove City.....	8.79	2.52	.58	3.10	3.77	-----	21.81
2461	do.....	do.....	Fayetteville.....	9.00	1.84	.92	2.76	3.36	-----	20.59
2019	do.....	do.....	Jamesville.....	8.89	1.92	.74	2.66	3.23	-----	20.06

2329	do.....	Fayetteville.....	8.94	1.74	.84	2.58	3.14	-----	19.78
545	do.....	Pilot Mountain.....	9.49	1.50	.92	2.42	2.94	-----	19.65
2796	do.....	Trenton.....	8.99	1.78	.78	2.56	3.11	-----	19.74
2879	do.....	St. Paul.....	9.03	1.14	1.10	2.24	2.72	-----	18.44
332	Richmond Guano Co., Richmond, Va.....	Gilt Edge Guano.....	8.91	1.50	1.08	2.58	3.14	-----	19.75
2563	Scotland Neck Guano Co., Scotland Neck, N. C.....	Biggs' 9-3-0 Fish Scrap Guano.....	9.47	2.64	.40	3.04	3.70	-----	22.24
2562	do.....	do.....	7.24	1.52	1.92	3.44	4.18	-----	21.69
518	do.....	do.....	8.07	1.34	1.00	2.34	2.84	-----	17.90
2186	Southern Cotton Oil Co., Fayetteville, N. C.....	Fayetteville.....	9.42	1.00	2.20	3.20	3.89	-----	22.86
2427	do.....	Cumberland.....	9.19	1.16	1.14	2.30	2.80	-----	18.85
2676	do.....	Elcase.....	8.93	1.08	1.04	2.12	2.58	-----	17.84
5330	Southern Cotton Oil Co., Monroe, N. C.....	Lumberton.....	9.02	1.58	.52	2.10	2.55	-----	17.84
2965	Southern Cotton Oil Co., Wilson, N. C.....	Lucama.....	8.71	1.34	.96	2.30	2.80	-----	18.37
2941	do.....	Lucama.....	8.70	1.14	1.08	2.22	2.70	-----	18.02
2237	Swift & Co. Fertilizer Works, Atlanta, Ga.....	Charlotte.....	8.34	.86	1.24	2.10	2.55	-----	17.16
231	do.....	Elizabeth City.....	9.95	.72	1.58	2.30	2.80	-----	19.61
2757	Tuscarora Fertilizer Co., Wilmington, N. C.....	Windsor.....	8.61	1.76	1.16	2.92	3.55	-----	20.87
307	Union Seed and Fertilizer Co., Wilmington, N. C.....	Chadbourn.....	9.40	1.06	1.08	2.14	2.60	-----	18.39
2850	do.....	Kerr.....	8.75	1.26	.96	2.22	2.70	-----	18.07
2379	do.....	Spring Hope.....	8.59	1.40	.84	2.24	2.72	-----	18.00
2029	do.....	Marietta.....	8.99	1.34	.78	2.12	2.58	-----	17.89
321	Upshur, R. L., Guano Co., Norfolk, Va.....	Littleton.....	9.10	1.64	.88	2.52	3.06	-----	19.08
2394	do.....	Upshur's 9-3 Ammoniated Phosphate.....	9.39	1.38	1.22	2.60	3.16	-----	20.31
2077	Va.-Car. Chemical Co., Richmond, Va.....	Harbinger.....	9.93	1.82	.72	2.54	3.09	-----	20.60
2027	do.....	Hope Mills.....	10.65	1.90	.44	2.34	2.84	-----	20.48
2282	do.....	Marietta.....	9.64	1.54	.98	2.52	3.06	-----	20.22
	do.....	Hope Mills.....	9.64	1.54	.98	2.52	3.06	-----	20.22

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
Brands claiming										
2083	Va.-Car. Chemical Co., Richmond, Va.	V.-C. Cotton Ammoniated Compound	Edenton	9.00	1.80	.50	2.47	3.00		\$19.37
2214	do.	Blue Ribbon Ammoniated Compound	Pilot Mountain	10.13	1.72	.78	2.30	2.80		19.79
278	do.	do.	Kinston	9.20	1.94	.50	2.50	3.04		19.70
516	do.	do.	Benson	9.63	1.94	.50	2.44	2.97		19.88
2529	do.	V.-C. Cotton Ammoniated Compound	Lumberton	8.99	2.12	.38	2.50	3.04		19.49
2058	do.	do.	Windsor	9.40	1.62	.80	2.42	2.94		19.56
2283	do.	do.	Hope Mills	9.71	1.72	.50	2.22	2.70		19.03
2225	do.	Special King Guano	Edenton	9.79	1.72	.46	2.18	2.65		18.95
Brand claiming	Eastern Cotton Oil Co., Hertford, N. C.	Half-and-Half Cotton-seed Meal and Acid Phosphate.	Columbia	7.91	.86	1.28	2.14	2.50		16.90
		Meal and Fish Mixture, No. 1	Robersonville	9.00			2.83	3.50		21.10
2135	Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.	Brewer's Special Ammoniated Phosphate, F. S. R.	Rocky Mount	7.50	.16	2.20	2.36	2.87		17.41
524	Royster, F. S., Guano Co., Norfolk, Va.	1916 Troutman's 7% F. T. E. Guano.	Elizabeth City	9.00			4.11	5.00		26.30
2085	Troutman Mfg. Co., Churchland, Va.	Homestead Ammoniated Fertilizer	Hazelwood	9.05	1.32	2.50	3.82	4.64		25.09
Brands claiming	American Agricultural Guano Co., Spartanburg, S. C.	Atlantic Sunset Ammoniated Phosphate	Kenly	9.46	.98	2.74	3.72	4.52		25.08
		Atlantic Sunset Ammoniated Phosphate	Kenly	8.68	3.52	2.16	5.68	6.91		32.54
2877	Atlantic Chemical Corporation, Norfolk, Va.	Atlantic Sunset Ammoniated Phosphate	Kenly	10.00			1.65	2.00		16.93
2443	Brands claiming	Atlantic Sunset Ammoniated Phosphate	Kenly	10.22	.60	.86	1.46	1.78		16.35
				9.76	.98	.54	1.52	1.85		16.14

2442	Bryant Fertilizer Co., Alexandria, Va.....	Bryant's Ammoniated Superphosphate.....	Kenly.....	10.61	1.04	.46	1.50	1.82	-----	16.91
2311	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Caraleigh 10-2 Ammoniated Phosphate.....	Siler City.....	11.93	1.06	.40	1.46	1.78	-----	18.06
2439	Conestee Chemical Co., Wilmington, N. C.....	Conestee 10-2-0 Fertilizer.....	Kenly.....	8.80	1.86	.54	2.40	2.92	-----	18.88
2172	Farmers Guano Co., Raleigh, N. C.....	Farmers' F. G. C. 10-2 Ammoniated Phosphate.....	South Mills.....	9.86	1.24	.60	1.84	2.24	-----	17.59
2309	Georgia Chemical Works, Augusta, Ga.....	Georgia Ammoniated Compound Super- phosphate.....	Liberty.....	9.72	1.48	.46	1.94	2.36	-----	17.87
2023	Navassa Guano Co., Wilmington, N. C.....	Navassa Ammoniated Superphosphate.....	Jamesville.....	10.39	1.16	.50	1.66	2.02	-----	17.36
309	do.....	do.....	Vineland.....	9.75	1.22	.36	1.58	1.92	-----	16.39
2179	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.....	Special Corn and Cotton Guano.....	Fort Barnwell.....	9.96	.18	1.68	1.86	2.26	-----	17.77
2590	Old Buck Guano Co., Richmond, Va.....	Old Buck Ammoniated Phosphate.....	Stokesdale.....	10.59	.90	.64	1.54	1.87	-----	17.06
371	Rasin-Monumental Co., Baltimore, Md.....	Celebrated Universal Fertilizer Special Crop Preparation.....	Franklinton.....	10.15	1.06	.60	1.66	2.02	-----	17.12
2018	Royster, F. S., Guano Co., Norfolk, Va.....	Royster's Ovation Brand Ammoniated.....	Jamesville.....	9.70	.50	1.36	1.86	2.26	-----	17.51
2913	Tidewater Guano Co., Norfolk, Va.....	Tidewater 2-10 Guano.....	Roxboro.....	9.87	.98	.52	1.50	1.82	-----	16.17
2755	Tuscarora Fertilizer Co., Wilmington, N. C.....	Tuscarora Ammoniated Superphosphate.....	Windsor.....	9.52	1.56	1.08	2.64	3.21	-----	20.61
2588	Union Guano Co., Winston-Salem, N. C.....	Union Special 10-2-0 Superphosphate.....	Walnut Cove.....	9.66	1.14	.36	1.50	1.82	-----	15.96
2949	Va.-Car. Chemical Co., Richmond, Va.....	Durham Ammoniated Compound.....	St. Paul.....	10.45	1.08	.72	1.80	2.19	-----	18.01
2586	do.....	Old Dominion Anso Compound.....	Madison.....	10.32	1.24	.32	1.56	1.89	-----	16.87
2206	do.....	Southern Chemical Co.'s Monarch Am- moniated Compound.....	Mount Airy.....	10.32	1.18	.38	1.56	1.89	-----	16.87
	Brands claiming.....	do.....	do.....	10.00	-----	-----	2.47	3.00	-----	20.37
2175	Baugh & Sons Co., Philadelphia, Pa.....	Baugh Ammoniated Superphosphate.....	Elizabeth City.....	9.86	1.62	.82	2.44	2.97	-----	20.11
1688	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers' Union 10-3.....	China Grove.....	9.85	2.38	.02	2.40	2.92	-----	19.93
2236	Dixie Guano Co., Suffolk, Va.....	Dixie Guano.....	Bosley.....	10.86	1.64	.62	2.26	2.75	-----	20.35
2109	Imperial Company, Norfolk, Va.....	Imperial 3-10-0 Fertilizer.....	Travis.....	9.85	1.66	.82	2.48	3.02	-----	20.27
2651	Martin Fertilizer Co., Norfolk, Va.....	Martin's Ammoniated Compound.....	Elizabeth City.....	10.05	1.80	.52	2.32	2.82	-----	19.79
2768	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.....	Special Corn and Cotton Guano.....	Trenton.....	9.65	.78	1.40	2.18	2.65	-----	18.81
2392	Va.-Car. Chemical Co., Richmond, Va.....	V.-C. Victor Ammoniated Compound.....	Elizabeth City.....	10.00	1.26	1.32	2.58	3.14	-----	20.83

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
MIXED FERTILIZERS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Total Potash	
	Brands claiming			10.00			3.29	4.00		\$23.82
349	American Fertilizing Co., Norfolk, Va.	American 10 and 4 Ammoniated Compound.	Wadesboro.	9.75	2.82	.52	3.34	3.94		23.78
2922	Armour Fertilizer Works, Greensboro, N. C.	Armour's Ammoniated Superphosphate.	Mebane.	9.88	1.06	1.98	3.04	3.70		22.65
2840	Atlantic Chemical Corporation, Norfolk, Va.	Atlantic Drum Major Ammoniated Phosphate.	Jamesville.	10.59	2.56	.78	3.34	4.06		24.62
2173	Baugh & Sons Co., Norfolk, Va.	Baugh's High Grade Ammoniated Base.	Elizabeth City.	10.03	2.40	.82	3.22	3.91		23.55
2373	Carolina Union Fertilizer Co., Norfolk, Va.	Carolina Union 10-4.	Hertford.	10.17	1.84	1.42	3.26	3.96		23.86
2597	Coe-Mortimer Co., Charleston, S. C.	Coe-Mortimer Co. Fertilizer.	Wilson.	9.24	2.08	.76	2.84	3.45		21.17
2611	Columbia Guano Co., Norfolk, Va.	Columbia Ammonia Phosphate Mixture.	Elizabeth City.	11.07	2.04	.98	3.02	3.67		23.75
2198	McCabe Fertilizer Co., Charleston, S. C.	McCabe's Special, No. 7.	Red Springs.	10.37	1.78	1.34	3.12	3.79		23.47
2216	New Bern Cotton Oil Co., New Bern, N. C.	Exums Meal and Fish Guano.	Snow Hill.	9.80	2.02	1.40	3.42	4.16		24.16
2240	Rasin-Monumental Co., Baltimore, Md.	Dixie Ammoniated Superphosphate.	Lawndale.	10.72	2.10	.78	2.88	3.05		22.82
2540	Robeson Mfg. Co., Lumberton, N. C.	R. M. C. 10-4.	Lumberton.	10.15	.84	1.94	2.78	3.38		21.83
2037	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Landmark Ammoniated Phosphate.	St. Paul.	10.52	2.14	1.12	3.26	3.96		24.21
2403	do.	do.	Shelby.	10.21	2.24	1.04	3.28	3.99		23.99
2648	do.	do.	Camden.	9.90	2.36	.94	3.30	4.01		23.76
2491	Southern Cotton Oil Co., Charlotte, N. C.	S. O. Co.'s Ammoniated Compound.	Shelby.	10.39	1.48	2.58	4.06	4.94		27.44
2899	Southern Cotton Oil Co., Shelby, N. C.	do.	Shelby.	10.04	2.32	.80	3.12	3.79		23.14

2898	do.	do.	Shelby	11.00	1.22	2.26	3.48	4.23	25.62
295	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special Baltimore Formula.	Elizabeth City.	8.95	1.84	1.78	3.62	4.40	24.15
2627	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's 10-4 Ammoniated Phosphate.	Harbinger	10.20	2.20	.96	3.16	3.84	23.47
	Brand claiming			11.00			.82	1.00	14.44
2313	Brown, H. P., Guano Co., Salisbury, N. C.	Brown's 11-1-0 Ammoniated Compound.	Staley	9.27	.46	1.04	1.50	1.82	15.57
	Brands claiming			11.00			2.47	3.00	21.37
1690	Coöperative Warehouse Co., Salisbury, N. C.	Farmers' Union 11-3.	China Grove.	10.76			2.48	3.02	21.18
2362	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Ammoniated Superphosphate.	China Grove.	10.69	1.32	1.10	2.42	2.94	20.85
	Brands claiming			12.00			1.65	2.00	18.93
2212	Baugh & Sons Co., Philadelphia, Pa.	Baugh's Old Standby Dissolved Animal Base.	Siloam	11.80	1.20	.64	1.84	2.24	19.53
2034	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Caraleigh 12-2 Ammoniated Phosphate.	Marietta	12.86	1.02	.70	1.72	2.09	20.03
2759	Farmers Guano Co., Norfolk, Va.	Farmers' Bull.	Bosley	12.48	1.22	.42	1.64	1.99	19.37
311	Navassa Guano Co., Wilmington, N. C.	Standard Ammoniated Superphosphate.	Vineland.	10.28	1.58	.46	2.04	2.48	18.85
2331	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Valley Brand Ammoniated Phosphate.	Fayetteville.	11.35	1.06	.66	1.72	2.09	18.57
488	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Ammoniated Phosphate.	Stem.	11.38	.60	1.30	1.90	2.31	19.36
	Brands claiming			10.00					3.00 25.00
189	Armour Fertilizer Works, Greensboro, N. C.	Armour's Acid and Potash.	Fayetteville.	10.70					2.92 25.30
191	do.	do.	Fayetteville.	10.24					2.89 24.69
116	Va.-Car. Chemical Co., Richmond, Va.	Durham Fertilizer Co.'s Diamond Wheat Mixture.	Sanford.	10.20					2.64 23.50

RAW OR UNMIXED FERTILIZER MATERIALS.

	Brands claiming			14.00					12.60
2923	Armour Fertilizer Works, Greensboro, N. C.	Armour's Star Phosphate.	Burlington.	14.14					12.73
2969	Royster, F. S., Guano Co., Norfolk, Va.	Royster's 14% Acid Phosphate.	Fayetteville.	14.04					12.64

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

RAW OR UNMIXED FERTILIZER MATERIALS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100						Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	Potash	
Brands claiming.....										
2658	Acme Mfg. Co., Wilmington, N. C.....	Acme 16% Acid Phosphate.....	Fayetteville.....	16.00						\$14.40
2729	do.....	do.....	Nashville.....	17.44						15.70
378	American Agricultural Chemical Co., New York, N. Y.....	16% Acid Phosphate.....	Franklinton.....	17.05						15.34
2466	do.....	16% Superphosphate.....	St. Paul.....	16.57						14.91
185	American Fertilizing Co., Norfolk, Va.....	American High Grade Acid Phosphate.....	Dunn.....	16.34						14.71
2262	do.....	do.....	Smithfield.....	17.42						15.68
190	Armour Fertilizer Works, Greensboro, N. C.....	Armour's 16% Acid Phosphate.....	Fayetteville.....	16.15						14.53
187	do.....	do.....	Fayetteville.....	16.51						14.86
188	do.....	do.....	Fayetteville.....	16.85						15.16
193	do.....	do.....	Fayetteville.....	16.64						14.98
2497	do.....	do.....	Fayetteville.....	16.63						14.97
2895	do.....	do.....	Shelby.....	16.50						14.85
2488	Arps, George L., & Co., Norfolk, Va.....	Arps' High Grade 16% Acid Phosphate.....	Old Trap.....	16.00						14.40
2272	Atlantic Chemical Corporation, Norfolk, Va.....	Atlantic High Grade 16% Acid Phosphate.....	Rich Square.....	15.86						14.27
549	Baugh & Sons Co., Philadelphia, Pa.....	Baugh's 16% Acid Phosphate.....	Ahoskie.....	16.00						14.40
2465	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	Caraleigh 16% Acid Phosphate.....	Winston-Salem.....	16.90						15.21
2629	Contentnea Guano Co., Wilson, N. C.....	16% Acid Phosphate.....	Fayetteville.....	16.97						15.27
			Scotland Neck.....	16.64						14.98

2650	.....do.....	High Grade Acid Phosphate.....	Tillery.....	16.42	-----	14.75
2390	.....do.....	High Grade 16% Acid Phosphate.....	Spring Hope.....	16.14	-----	14.53
345	Conestee Chemical Co., Wilmington, N. C.....	16% Acid Phosphate.....	Fayetteville.....	17.44	-----	15.70
2655	.....do.....	do.....	Vander.....	17.23	-----	15.51
2696	.....do.....	do.....	Tar Heel.....	16.97	-----	15.27
186	.....do.....	do.....	Fayetteville.....	16.73	-----	15.06
2202	.....do.....	do.....	Manchester.....	16.67	-----	15.00
2861	Columbia Guano Co., Norfolk, Va.....	Columbia High Grade 16% Acid Phosphate.....	Toecane.....	17.16	-----	15.44
2958	Conestee Chemical Co., Wilmington, N. C.....	Conestee 16% Acid Phosphate.....	Fayetteville.....	10.64	-----	14.98
2814	Coöperative Warehouse Co., Salisbury, N. C.....	Farmers' Union 16% Acid Phosphate.....	Kerr.....	17.17	-----	15.45
2424	.....do.....	do.....	Wake Forest.....	17.01	-----	15.31
464	Cotton States Fertilizer Works, Chester, S. C.....	Cotton States Acid Phosphate, 16% High Grade.....	Newton.....	17.20	-----	15.48
2128	Coweta Fertilizer Co., Newnan, Ga.....	Coweta 16% Acid Phosphate.....	Dunn.....	16.85	-----	15.16
200	.....do.....	do.....	Mount Gilead.....	16.44	-----	14.80
2178	Craven Chemical Co., New Bern, N. C.....	Panama 16% Acid Phosphate.....	Kinston.....	16.14	-----	14.53
2335	Dixie Guano Co., Suffolk, Va.....	Dixie Acid Phosphate.....	Bosley.....	15.85	-----	14.26
2126	Dunn Oil Mill Co., Dunn, N. C.....	16% Acid Phosphate.....	Dunn.....	17.27	-----	15.54
2111	Eastern Cotton Oil Co., Hertford, N. C.....	do.....	Columbia.....	15.75	-----	14.17
1687	Farmers Coöperative Warehouse Co., Salisbury, N. C.....	Farmers' Union Acid Phosphate, 16% High Grade.....	China Grove.....	16.82	-----	15.14
2171	Farmers Guano Co., Norfolk, Va.....	Farmers' Trade Mark F. G. C. Acid Phosphate, 16%.....	South Mills.....	16.87	-----	15.18
2310	Georgia Chemical Works, Augusta, Ga.....	High Grade Acid Phosphate.....	Liberty.....	17.49	-----	15.74
198	.....do.....	High Grade Dissolved Acid Phosphate.....	Wadesboro.....	17.47	-----	15.72
2270	Hampton Guano Co., Norfolk, Va.....	Hampton Supreme Acid Phosphate, 16%.....	Ahoskie.....	16.38	-----	14.74
2551	Imperial Company, Norfolk, Va.....	Imperial 16% Acid Phosphate.....	Lumberton.....	17.15	-----	15.44
2088	.....do.....	do.....	Currituck.....	16.95	-----	15.25
2077	International Agricultural Co., Spartanburg, S. C.....	International High Grade 16% Acid Phosphate.....	Grover.....	17.69	-----	15.32

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.
RAW OR UNMIXED FERTILIZER MATERIALS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition of Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	
	Brands claiming			16.00					\$14.40
462	International Agricultural Co., Spartanburg, S. C.	International High Grade 16% Acid Phosphate.	Kings Mountain	16.77					15.09
2559	Mc Nair Phosphate Co., Laurinburg, N. C.	do	Fayetteville	16.45					14.80
2448	do	do	St. Paul	16.07					14.46
2255	do	do	Hope Mills	15.89					14.30
2438	Meadows, E. H. & J. A., Co., New Bern, N. C.	Meadows' Diamond Acid Phosphate.	Bailey	17.41					15.67
2624	do	do	Cove City	16.86					15.17
2621	do	do	Cove City	16.14					14.53
2288	Maloney & Carter, Charleston, S. C.	Maloney & Carter Co.'s H. G. 16% Acid Phosphate.	Garner	15.87					14.28
506	Navassa Guano Co., Wilmington, N. C.	Navassa 16% Acid Phosphate.	Concord	17.51					15.76
2143	do	do	Robersonville	15.89					14.30
2354	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	16% Acid Phosphate.	Trenton	16.47					14.82
485	do	do	Trenton	16.05					14.45
2924	Nitrate Agencies Co., New York, N. Y.	High Grade Acid Phosphate, N. A. C. Brand.	Columbia	16.85					15.16
513	do	do	Enfield	16.82					15.14
2140	do	do	Robersonville	15.78					14.20
2802	N. C. Farmers' Union, Statesville, N. C.	N. C. Farmers' Union 16% Acid Phosphate.	Trenton	19.15					17.24
2691	do	do	White Oak	17.67					15.90

2256	do.....	do.....	Trenton.....	17.23	15.51
2246	do.....	do.....	Charlotte.....	16.09	14.48
2494	do.....	do.....	Lawndale.....	16.79	15.11
2430	Norfolk Fertilizing Co., Norfolk, Va.....	Oriana 16% Acid Phosphate.....	Fayetteville.....	17.50	15.75
251	Palmetto Guano Corporation, Columbia, S. C.....	Palmetto Acid Phosphate.....	Parkton.....	16.30	14.67
252	do.....	do.....	Parkton.....	15.92	14.33
264	Pamlico Chemical Co., Washington, N. C.....	Pamlico High Grade 16% Acid Phosphate.....	Bayboro.....	17.10	15.39
478	do.....	do.....	Wildwood.....	16.55	14.90
2222	Patapasco Guano Co., Baltimore, Md.....	Florida Soluble Phosphate.....	Snow Hill.....	17.03	15.33
2242	do.....	do.....	Patterson Springs.....	17.30	15.57
2740	do.....	do.....	Huntersville.....	16.53	14.88
2136	Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.....	Acid Phosphate.....	Robersonville.....	16.18	14.56
2031	Pearsall & Co., Wilmington, N. C.....	Pearsall's High Grade 16% Acid Phosphate.....	Clarkton.....	16.57	14.91
2070	do.....	do.....	Linden.....	16.50	14.85
2038	do.....	do.....	Marietta.....	16.32	14.69
184	do.....	do.....	Fonville.....	14.81	13.33
403	Peruvian Guano Corporation, Charleston, S. C.....	Peruvian High Grade Acid Phosphate.....	Marshall.....	16.74	15.07
448	Pocahontas Guano Co., Lynchburg, Va.....	Carrington's S. C. Phosphate, Waukesha Brand.....	Brown Summit.....	16.68	15.01
546	Pocomoke Guano Co., Norfolk, Va.....	Superb Acid Phosphate, 16%.....	Stoneville.....	17.15	15.44
402	do.....	do.....	Cherryville.....	16.79	15.11
2167	do.....	do.....	Elizabeth City.....	16.19	14.57
2241	Rasin-Monumental Co., Baltimore, Md.....	Rasin's Acid Phosphate.....	Lawndale.....	16.14	14.53
370	do.....	Rasin Celebrated Universal Fertilizer.....	Franklinton.....	16.00	14.40
2298	Richmond Guano Co., Richmond, Va.....	Dissolved Bone.....	Spring Hope.....	17.26	15.53
2943	Robertson Fertilizer Co., Norfolk, Va.....	High Peak Acid Phosphate.....	Fremont.....	16.59	14.93
2166	do.....	do.....	Elizabeth City.....	16.00	14.40

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

RAW OR UNMIXED FERTILIZER MATERIALS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphoric Acid	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia		Potash
Brands claiming									
2422	Rock-Ashcraft-Wilkinson Co., Charleston, S.C.	16% Acid Phosphate	Marshville	16.00					\$14.40
2021	Royster, F. S., Guano Co., Norfolk, Va.	Columbia High Grade 16% Acid Phosphate.	Jamesville	16.58					14.92
2862	do	Royster's High Grade 16% Acid Phosphate.	Toocane	16.02					14.42
2335	do	do	Fayetteville	17.04					15.34
353	do	do	Fayetteville	16.85					15.16
2460	do	do	Elizabeth City	16.64					14.98
344	do	do	Fayetteville	16.29					14.66
2332	do	do	Fayetteville	16.22					14.60
2619	Scotland Neck Guano Co., Scotland Neck, N. C.	do	Fayetteville	15.93					14.34
2618	do	16% Acid Phosphate	Cove City	16.98					15.28
2492	Southern Cotton Oil Co., Shelby, N. C.	do	Cove City	16.46					14.81
2896	do	S. C. O. Co.'s 16% Acid Phosphate	Shelby	17.25					15.52
397	Swift & Co. Fertilizer Works, Chester, S. C.	S. C. O. Co.'s High Grade Acid Phosphate.	Shelby	16.78					15.10
2113	Swift & Co. Fertilizer Works, Atlanta, Ga.	Swift's Special High Grade Acid Phosphate.	Charlotte	17.51					15.76
294	do	do	Garner	17.12					15.41
399	Swift & Co. Fertilizer Works, Wilmington, N.C.	do	Elizabeth City	16.07					14.46
2593	Tomlinson & Co., Wilson, N. C.	do	Cliffside	15.57					14.01
		Magie Dissolved Bone	Wilson	16.64					14.98

2364	Tuscarora Fertilizer Co., Greensboro, N. C.	Tuscarora Acid Phosphate	China Grove	16.74			15.07
457	do.	do.	Hickory	16.14			14.53
2756	do.	do.	Windsor	15.97			14.37
2185	Union Guano Co., Winston-Salem, N. C.	Union 16% Acid Phosphate	Fayetteville	17.28			15.52
501	do.	do.	Gastonia	16.58			14.92
2423	Upshur, R. L., Guano Co., Norfolk, Va.	Upshur's 16% Acid Phosphate	Elizabeth City	16.87			15.18
2207	Va.-Car. Chemical Co., Richmond, Va.	Comet 16% Acid Phosphate	Mount Airy	16.19			14.57
800	do.	Travers & Co.'s Champion Acid Phosphate.	Monroe	17.28			15.55
2292	do.	Travers' Standard Acid Phosphate	Clyde	17.39			15.65
2361	do.	V.-C. 16% Acid Phosphate	Pineville	17.00			15.30
2359	do.	do.	Fort Mills	16.69			15.02
2226	Winborne Guano Co., Norfolk, Va.	High Grade 16% Acid Phosphate	Edenton	15.90			14.31
Brands claiming							
2228	Farmers Guano Co., Norfolk, Va.	Ground Fish	Edenton		8.22	10.00	32.83
257	Foreign Products Co., Inc., Baltimore, Md.	Fish Guano	Parkton		8.22	10.00	32.88
217	do.	10% Fish Guano	Edenton		8.02	9.75	32.08
258	do.	Fish Guano	Parkton		7.68	9.34	30.72
2837	do.	10% Fish Guano	Parkton		7.70	9.36	30.80
2125	Imperial Company, Norfolk, Va.	Dry Ground Fish	Williamston		7.54	9.17	30.16
2477	Meadows, E. H. & J. A., Co., New Bern, N. C.	Fish Scrap	Dunn		7.24	8.80	28.95
512	Nitrate Agencies Co., Norfolk, Va.	N. A. C. Brand Ground Dried Fish	Grafton		8.80	10.70	35.20
2836	do.	do.	Whitakers		8.28	10.07	33.12
2197	do.	N. A. C. Brand Ground H. G. Tankage	Williamston		8.24	10.02	32.96
2082	Winborne Guano Co., Norfolk, Va.	Ground Fish Tankage	Manchester		7.32	8.90	29.28
2014	Pearsall & Co., Wilmington, N. C.	Fish Scrap	Edenton		7.54	9.17	30.16
			Mount Olive		8.68	10.55	34.72

ANALYSES OF COMMERCIAL FERTILIZERS—SPRING SEASON, 1917.

RAW OR UNMIXED FERTILIZER MATERIALS.

Laboratory Number	Name and Address of Manufacturer	Name of Brand	Where Sampled	Percentage Composition or Parts per 100					Relative Value per Ton at Factory
				Available Phosphate	Water-soluble Nitrogen	Organic Nitrogen	Total Nitrogen	Equivalent to Ammonia	
	Brands claiming								
2016	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.	Kanona Tankage	Mount Olive				9.04	10.99	\$36.20
2015	Farmers Guano Co., Raleigh, N. C.	do.	Mount Olive				9.32	11.33	37.28
2116	Hardison & Hardison, Wadesboro, N. C.	Ground High Grade Tankage	Lilesville				8.68	10.55	34.72
2334	Royster, F. S., Guano Co., Norfolk, Va.	Royster's Tankage	Fayetteville				7.82	9.51	31.28
	Brand claiming						9.74	11.84	38.96
	Clayton Oil Mill, Clayton, N. C.	Barbour's Top Dresser, Half Meal and Half Soda.	Clayton				10.25	12.46	41.00
2887							9.54	11.60	38.16
	Brand claiming						13.16	16.00	52.64
192	Armour Fertilizer Works, Wilmington, N. C.	Dried Blood	Fayetteville				13.06	15.88	52.24
	Brands claiming						14.81	18.00	59.24
2819	American Fertilizing Co., Norfolk, Va.	Nitrate of Soda	Dunn				14.76	17.95	59.04
2821	do.	do.	Dunn				14.28	17.36	57.12
2890	Armour Fertilizer Works, Greensboro, N. C.	do.	Fayetteville				15.08	18.33	60.32
2688	do.	do.	Lena				14.88	18.09	59.52
2971	Grace, W. R., & Co., New York, N. Y.	do.	Fayetteville				14.92	18.14	59.88
2741	do.	do.	Huntersville				14.80	17.99	59.20
2571	Jossey, N. B., Guano Co., Tarboro, N. C.	do.	Cove City				15.00	18.24	60.00
2622	Meadows, E. H. & J. A., Co., New Bern, N. C.	do.	Cove City				15.00	18.24	60.00

2332	Powhatan Chemical Co., Richmond, Va.....	do.....	Wilson.....	15.00	18.24	60.00
2312	Tuscarora Fertilizer Co., Greensboro, N. C.....	do.....	Roxboro.....	14.12	17.17	56.48
2391	Winborne Guano Co., Norfolk, Va.....	do.....	Hertford.....	15.16	18.43	60.64
	Brand claiming			15.00	18.24	60.00
2398	Nitrate Agencies Co., Norfolk, Va.....	Nitrate of Soda.....	Edenton.....	14.92	18.14	59.68
	Brand claiming			15.22	18.50	60.88
2265	Old Buck Guano Co., Richmond, Va.....	do.....	Aboskie.....	15.36	18.67	61.40
	Brand claiming			15.63	19.00	62.52
2104	Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.....	do.....	Fayetteville.....	15.00	18.24	60.00
	Brand claiming			4.95	6.02	26.39
2148	Josey, N. B., Guano Co., Tarboro, N. C.....	Josey's 7-6 Fish Scrap Guano.....	Bethel.....	8.41* 12.00*	3.08 1.72	26.89
	Brand claiming			7.81	9.50	42.40
2596	Coe-Mortimer Co., Charleston, S. C.....	Imported Fish Guano.....	Wilson.....	7.50	9.12	42.52

*Total Phosphoric Acid valued at 4 cents per pound.

II. ANALYSES COTTON SEED MEAL.

Laboratory Number	Name and Address of Manufacturer	Where Sampled	Per Cent	Equivalent	Ammonia	Per Cent	Equivalent
			Nitrogen Guaranteed	to	Found	Nitrogen Found	to Ammonia
1224	Empire Cotton Oil Co., Atlanta, Ga.....	Asheville.....	3.29	4.00	3.12	3.79	
1441	Poe Cotton-seed Products Co., Memphis, Tenn...	Biltmore.....	3.29	4.00	3.50	4.26	
1223	Southern Cotton Oil Co., Albany, Ala.....	Asheville.....	4.11	5.00	5.96	7.25	
1354	Lenoir Oil and Ice Co., Kinston, N. C.....	Trenton.....	4.93	6.00	5.06	6.15	
1284	Eastern Cotton Oil Co., Elizabeth City, N. C.....	Elizabeth City....	5.35	6.50	5.07	6.16	
1215	Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.	Whitakers.....	5.35	6.50	5.30	6.44	
1206	American Milling Co., Asheville, N. C.....	Sylva.....	5.76	7.00	5.68	6.91	
1225	...do.....	Woodfin Siding...	5.76	7.00	5.76	7.00	
1320	Armour Fertilizer Works, Wilmington, N. C.....	White Oak.....	5.76	7.00	5.58	6.78	
1296	...do.....	Lena.....	5.76	7.00	5.20	6.32	
1442	Atlanta Cotton Oil Co., Atlanta, Ga.....	Murphy.....	5.76	7.00	5.18	6.30	
1268	Bertie Cotton Oil Co., Aulander, N. C.....	Rich Square.....	5.76	7.00	5.88	7.15	
1291	Buckeye Cotton Oil Co., Charlotte, N. C.....	Hamlet.....	5.76	7.00	5.66	6.88	
1264	...do.....	Lumberton.....	5.76	7.00	4.78	5.81	
1219	...do.....	Clifton.....	5.76	7.00	5.74	6.98	
1216	...do.....	Liberty.....	5.76	7.00	5.84	7.10	
1447	...do.....	Fayetteville.....	5.76	7.00	5.58	6.81	
1351	...do.....	Huntersville.....	5.76	7.00	5.74	6.98	
1146	...do.....Cineinnati, Ohio.....	Charlotte.....	5.76	7.00	5.62	6.83	
1343	...do.....	Murphy.....	5.76	7.00	5.34	6.49	
1344	...do.....	Murphy.....	5.76	7.00	5.84	7.10	
1222	...do.....	Pineville.....	5.76	7.00	5.68	6.91	
12	...do.....Macon, Ga.....	Murphy.....	5.76	7.00	5.30	6.44	
1443	...do.....	Murphy.....	5.76	7.00	5.58	6.78	
1102	Chowan Cotton Oil and Fertilizer Co., Edenton, N. C.	Edenton.....	5.76	7.00	5.62	6.83	
1257	Cotton Oil and Ginning Co., Scotland Neck, N. C.	Scotland Neck....	5.76	7.00	5.26	6.40	
1342	Covington Oil Co., Covington, Ga.....	Bryson City.....	5.76	7.00	5.64	6.86	
1098	Eastern Cotton Oil Co., Hertford, N. C.....	Roper.....	5.76	7.00	5.48	6.66	
1434	...do.....	Scotland Neck....	5.76	7.00	4.98	6.05	
1340	Elberton Oil Mills, Elberton, Ga.....	Franklin.....	5.76	7.00	5.52	6.71	
932	...do.....	Varina.....	5.76	7.00	5.96	7.25	
1341	Empire Cotton Oil Co., Atlanta, Ga.....	Whittier.....	5.76	7.00	5.66	6.88	
1422	Farmers Cotton Oil Co., Wilson, N. C.....	Kenly.....	5.76	7.00	5.02	6.10	
1287	...do.....	Daisy Siding.....	5.76	7.00	5.24	6.37	
1047	...do.....	Pikeville.....	5.76	7.00	5.02	6.10	
1281	...do.....	Tillery.....	5.76	7.00	5.46	6.64	
1390	...do.....	Smithfield.....	5.76	7.00	5.08	6.18	
1288	Farmville Oil and Fertilizer Co., Farmville, N. C.	Farmville.....	5.76	7.00	5.22	6.35	

II. ANALYSES COTTON SEED MEAL.

Laboratory Number	Name and Address of Manufacturer	Where Sampled	Per Cent	Guaranteed	Equivalent	Ammonia	Per Cent	Found	Equivalent	Ammonia
			Nitrogen		to		Nitrogen		to	
1144	Farmville Oil and Fertilizer Co., Farmville, N. C.	Farmville.....	5.76	7.00	5.66	6.88				
1212	Home Oil Mill, New Decatur, Ala.....	Canton.....	5.76	7.00	5.46	6.64				
1205	...do.....	Waynesville.....	5.76	7.00	5.36	6.52				
1383	...do.....	Hazelwood.....	5.76	7.00	5.68	6.91				
1401	...do.....	Asheville.....	5.76	7.00	5.74	6.98				
1388	Kershaw Oil Mill, Kershaw, S. C.....	Kernersville.....	5.76	7.00	5.42	6.59				
1204	...do.....	Waynesville.....	5.76	7.00	5.84	7.10				
1210	Lancaster Cotton Oil Co., Lancaster, S. C.....	Fort Mill, S. C....	5.76	7.00	5.96	7.25				
1271	...do.....	Hendersonville....	5.76	7.00	5.96	7.25				
1270	Laura & Brothers, Nashville, Tenn.....	Hendersonville....	5.76	7.00	5.86	7.12				
1140	Lee County Cotton Oil Co., Sanford, N. C.....	Greensboro.....	5.76	7.00	4.80	5.84				
1346	Lenoir Oil and Ice Co., Kinston, N. C.....	Goldsboro.....	5.76	7.00	5.00	6.08				
1380	...do.....	Trenton.....	5.76	7.00	5.28	6.42				
1249	...do.....	Kinston.....	5.76	7.00	4.98	6.05				
1237	...do.....	Kinston.....	5.76	7.00	5.02	6.10				
1016	...do.....	Kinston.....	5.76	7.00	5.00	6.08				
1379	New Bern Cotton Oil and Fertilizer Mills, New Bern, N. C.	Trenton.....	5.76	7.00	5.48	6.66				
1209	...do.....	Trenton.....	5.76	7.00	5.64	6.86				
1207	...do.....	Trenton.....	5.76	7.00	4.98	6.05				
1279	...do.....	Cove City.....	5.76	7.00	5.30	6.44				
1265	...do.....	Grifton.....	5.76	7.00	5.64	6.86				
1350	...do.....	Trenton.....	5.76	7.00	5.72	6.95				
1280	...do.....	Cove City.....	5.76	7.00	5.28	6.42				
1389	Pine Level Oil Mill, Pine Level, N. C.....	Goldsboro.....	5.76	7.00	5.34	6.49				
1238	...do.....	Smithfield.....	5.76	7.00	5.36	6.52				
1088	Raleigh Cotton Oil Co., Raleigh, N. C.	Raleigh.....	5.76	7.00	5.64	6.86				
1461	...do.....	Youngsville.....	5.76	7.00	4.92	5.98				
1244	...do.....	Goldsboro.....	5.76	7.00	5.28	6.42				
1242	...do.....	Goldsboro.....	5.76	7.00	5.54	6.74				
1302	...do.....	Greensboro.....	5.76	7.00	5.40	6.57				
1141	...do.....	Raleigh.....	5.76	7.00	5.44	6.61				
1142	...do.....	Raleigh.....	5.76	7.00	5.34	6.49				
1143	...do.....	Raleigh.....	5.76	7.00	5.14	6.25				
999	...do.....	Garner.....	5.76	7.00	5.74	6.98				
1353	...do.....	Trenton.....	5.76	7.00	5.30	6.44				
1352	...do.....	Trenton.....	5.76	7.00	5.66	6.88				
1292	...do.....	Trenton.....	5.76	7.00	5.82	7.08				
1272	...do.....	Garner.....	5.76	7.00	4.82	5.86				

II. ANALYSES COTTON SEED MEAL.

Laboratory Number	Name and Address of Manufacturer	Where Sampled	Per Cent Nitrogen Guaranteed	Equivalent to Ammonia	Per Cent Nitrogen Found	Equivalent to Ammonia
1427	Robeson Manufacturing Co., Lumberton, N. C.	Hope Mills.....	5.76	7.00	5.98	7.27
1156	do.....	Hope Mills.....	5.76	7.00	5.54	6.74
1276	do.....	Hope Mills.....	5.76	7.00	5.44	6.61
1263	do.....	Lumberton.....	5.76	7.00	6.00	7.29
1148	do.....	Hope Mills.....	5.76	7.00	5.54	6.74
1203	Scott Brokerage and Commission Co., Charlotte, N. C.	Willets.....	5.76	7.00	5.88	7.15
1164	do.....	Wake Forest.....	5.76	7.00	5.40	6.57
10	do.....	Hillsboro.....	5.76	7.00	5.86	7.12
1201	Southern Cotton Oil Co., Albany, Ala.	Sylva.....	5.76	7.00	5.72	6.95
1406	do.....Augusta, Ga.	Polkton.....	5.76	7.00	6.92	7.44
1386	do.....Conetce, N. C.	Randolph Siding.....	5.76	7.00	4.90	5.96
997	do.....Charlotte, N. C.	Wadesboro.....	5.76	7.00	5.66	6.88
1184	do.....	Red Springs.....	5.76	7.00	5.66	6.88
1145	do.....	Lilesville.....	5.76	7.00	5.48	6.66
1173	do.....	Morven.....	5.76	7.00	5.48	6.66
1267	do.....Decatur, Ala.	Black Mountain.....	5.76	7.00	5.82	7.08
1100	do.....Fayetteville, N. C.	Fayetteville.....	5.76	7.00	5.22	6.35
1099	do.....	Fayetteville.....	5.76	7.00	5.54	6.74
1019	do.....	Rex.....	5.76	7.00	5.80	7.05
1039	do.....	Fayetteville.....	5.76	7.00	5.10	6.20
1038	do.....	Fayetteville.....	5.76	7.00	5.22	6.35
1037	do.....	Fayetteville.....	5.76	7.00	5.14	6.25
1324	do.....	Vander.....	5.76	7.00	5.16	6.27
1325	do.....	Fayetteville.....	5.76	7.00	5.46	6.64
1326	do.....	Fayetteville.....	5.76	7.00	5.44	6.61
1217	do.....	Clifton.....	5.76	7.00	5.12	6.22
1228	do.....	Fayetteville.....	5.76	7.00	5.12	6.22
1225	do.....	Fayetteville.....	5.76	7.00	5.74	6.98
1293	do.....	Fayetteville.....	5.76	7.00	5.76	7.00
1294	do.....	Fayetteville.....	5.76	7.00	5.14	6.25
1445	do.....	Fayetteville.....	5.76	7.00	5.22	6.35
1446	do.....	Fayetteville.....	5.76	7.00	5.30	6.44
1481	do.....	Lumber Bridge.....	5.76	7.00	5.30	6.44
1480	do.....	Fayetteville.....	5.76	7.00	5.20	6.32
1469	do.....	Roseboro.....	5.76	7.00	5.64	6.86
1426	do.....	Fayetteville.....	5.76	7.00	5.26	6.40
1444	do.....	Vander.....	5.76	7.00	5.22	6.35
1186	do.....	Fayetteville.....	5.76	7.00	5.58	6.78

II. ANALYSES COTTON SEED MEAL.

Laboratory Number	Name and Address of Manufacturer	Where Sampled	Per Cent	Guaranteed	Equivalent	Per Cent	Equivalent
			Nitrogen	Nitrogen	to	Nitrogen	to
			Found	Ammonia		Found	Ammonia
993	Southern Cotton Oil Co., Fayetteville, N. C.	Vander.....	5.76	7.00	5.12	6.22	
1166	...do.....	Fayetteville.....	5.76	7.00	5.26	6.40	
1167	...do.....	Fayetteville.....	5.76	7.00	5.14	6.25	
1168	...do.....	Fayetteville.....	5.76	7.00	5.36	6.52	
1176	...do.....	Fayetteville.....	5.76	7.00	5.32	6.47	
1175	...do.....	Fayetteville.....	5.76	7.00	4.94	6.01	
1349	...do..... Goldsboro, N. C.....	Trenton.....	5.76	7.00	5.70	6.93	
1211	...do.....	Garner.....	5.76	7.00	5.38	6.54	
1290	...do.....	Trenton.....	5.76	7.00	5.50	6.69	
1291	...do.....	Trenton.....	5.76	7.00	5.68	6.91	
1097	...do..... Rocky Mount, N. C.....	Rocky Mount.....	5.76	7.00	5.60	6.81	
1153	...do..... Selma, N. C.....	Smithfield.....	5.76	7.00	5.62	6.83	
1103	...do..... Shelby, N. C.....	Cleveland Mills.....	5.76	7.00	5.16	6.27	
1404	...do.....	Shelby.....	5.76	7.00	5.55	6.76	
1477	...do..... Spartanburg, S. C.....	Asheville.....	5.76	7.00	5.32	6.47	
1348	...do.....	Dillsboro.....	5.76	7.00	5.60	6.81	
1202	...do.....	Dillsboro.....	5.76	7.00	5.50	6.69	
1157	...do..... Tarboro, N. C.....	Kelford.....	5.76	7.00	5.30	6.44	
1286	...do..... Wilson, N. C.....	Daisy Siding.....	5.76	7.00	5.46	6.64	
1423	...do.....	Lucama.....	5.76	7.00	5.08	6.18	
1425	...do.....	Lucama.....	5.76	7.00	5.36	6.52	
1266	Swift & Co., Columbia, S. C.....	Black Mountain.....	5.76	7.00	5.70	6.93	
1408	...do.....	Siler City.....	5.76	7.00	7.86	7.12	
1409	...do.....	Tryon.....	5.76	7.00	5.84	7.10	
11	Taylor Commission Co., Atlanta, Ga.....	Bryson.....	5.76	7.00	5.80	7.05	
1231	...do.....	Lilesville.....	5.76	7.00	5.28	6.42	
1213	...do.....	Willow Springs.....	5.76	7.00	5.68	6.91	
1345	...do.....	Goldsboro.....	5.76	7.00	5.36	6.52	
1238	...do.....	Andrews.....	5.76	7.00	5.92	7.20	
1233	...do.....	Cove City.....	5.76	7.00	5.48	6.66	
1208	Trent Cotton Oil Co., Pollocksville, N. C.....	Pollocksville.....	5.76	7.00	5.78	7.03	
1154	Union Seed and Fertilizer Co., Atlanta, Ga.....	Red Springs.....	5.76	7.00	5.70	6.93	
1347	...do.....	Elkin.....	5.76	7.00	5.74	6.98	
1385	...do..... Raleigh, N. C.....	Randolph Siding.....	5.76	7.00	5.48	6.66	
1232	...do.....	Durham.....	5.76	7.00	5.42	6.59	
1104	...do..... Wilmington, N. C.....	Scotland Neck.....	5.76	7.00	5.42	6.59	
1473	...do.....	Scotland Neck.....	5.76	7.00	5.52	6.71	
1182	...do.....	Manchester.....	5.76	7.00	5.56	6.76	

II. ANALYSES COTTON SEED MEAL.

Laboratory Number	Name and Address of Manufacturer	Where Sampled	Per Cent Nitrogen Guaranteed	Equivalent to Ammonia	Per Cent Nitrogen Found	Equivalent to Ammonia
994	Union Feed and Fertilizer Co., Wilmington, N. C.	Fayetteville.....	5.76	7.00	5.40	6.57
1382	...do.....	Fletchers.....	5.76	7.00	5.84	7.10
1226	...do.....	Fayetteville.....	5.76	7.00	5.68	6.91
1323	...do.....	Fayetteville.....	5.76	7.00	5.34	6.49
1403	Willmont Oil Mills, Pelzer, S. C.....	Biltmore.....	5.76	7.00	5.58	6.78
1189	Wilson Cotton Oil Co., Wilson, N. C.....	Smithfield.....	5.76	7.00	4.96	6.03
1123	...do.....	Clayton.....	5.76	7.00	5.08	6.18
989	Woodard & Whitley, Whitakers, N. C.....	Walstonburg.....	5.76	7.00	5.18	6.30
1322	Bladen Manufacturing Co., Bladenboro, N. C....	Richardson.....	6.17	7.50	6.96	7.25
1049	...do.....	Clarkton.....	6.17	7.50	5.90	7.17
1257	...do.....	Richardson.....	6.17	7.50	5.68	6.91
1240	...do.....	Richardson.....	6.17	7.50	5.94	7.22
992	...do.....	Tar Heel.....	6.17	7.50	5.72	6.95
1289	Brodie, F. W., & Co., Memphis, Tenn.....	Scotland Neck....	6.17	7.50	6.02	7.32
1230	...do.....	Fayetteville.....	6.17	7.50	6.28	7.64
1218	...do.....	Clifton.....	6.17	7.50	5.98	7.27
1273	...do.....	Durant.....	6.17	7.50	6.34	7.71
1023	...do.....	Fayetteville.....	6.17	7.50	5.98	7.27
1084	...do.....	Louisburg.....	6.17	7.50	6.46	7.85
1373	...do.....	Williamston.....	6.17	7.50	6.04	7.34
1370	...do.....	Williamston.....	6.17	7.50	6.20	7.54
1430	...do.....	Williamston.....	6.17	7.50	6.12	7.44
1387	...do.....	Battleboro.....	6.17	7.50	6.16	7.49
9	...do.....	Benson.....	6.17	7.50	5.98	7.27
990	...do.....	Goldsboro.....	6.17	7.50	5.84	7.10
991	...do.....	Four Oaks.....	6.17	7.50	6.12	7.44
1178	Buckeye Cotton Oil Co., Charlotte, N. C.....	Fayetteville.....	6.17	7.50	5.64	6.86
1304	...do.....	St. Paul.....	6.17	7.50	6.32	7.68
1371	Chowan Cotton Oil and Fertilizer Co., Edenton, N. C.	Williamston.....	6.17	7.50	5.24	6.37
954	...do.....	Williamston.....	6.17	7.50	5.74	6.98
953	...do.....	Williamston.....	6.17	7.50	6.26	7.61
1214	Clayton Oil Mill, Clayton, N. C.....	Garner.....	6.17	7.50	5.50	6.69
1172	...do.....	Garner.....	6.17	7.50	5.44	5.61
931	...do.....	Varina.....	6.17	7.50	5.34	6.49
13	Commission Company, Atlanta, Ga.....	Franklin.....	6.17	7.50	5.86	7.12
16	Campobello Oil Co., Campobello, S. C.....	Asheville.....	6.17	7.50	5.60	6.81
1136	Consumers Cotton Oil Co., Tarboro, N. C.....	Williamston.....	6.17	7.50	5.88	7.15
957	...do.....	Williamston.....	6.17	7.50	5.46	6.64

II. ANALYSES COTTON SEED MEAL.

Laboratory Number	Name and Address of Manufacturer	Where Sampled	Per Cent Nitrogen Guaranteed	Equivalent to Ammonia	Per Cent Nitrogen Found	Equivalent to Ammonia
956	Consumers Cotton Oil Co., Tarboro, N. C.....	Williamston.....	6.17	7.50	6.12	7.44
955	...do.....	Williamston.....	6.17	7.50	5.32	6.47
1236	...do.....	Tarboro.....	6.17	7.50	5.70	6.93
1372	...do.....	Williamston.....	6.17	7.50	5.74	6.98
1042	Deans-Moyer & Co., Goldsboro, N. C.....	Princeton.....	6.17	7.50	3.30	4.01
1072	Dixie Cotton Oil Mill, Little Rock, Ark.....	Mount Olive.....	6.17	7.50	5.70	6.93
1285	Dunn Oil Mills, Dunn, N. C.....	Scotland Neck.....	6.17	7.50	6.02	7.32
7	...do.....	Dunn.....	6.17	7.50	6.22	7.56
1169	...do.....	Dunn.....	6.17	7.50	6.12	7.44
1405	Elba Manufacturing Co., Charlotte, N. C.....	Newells.....	6.17	7.50	5.78	7.03
1301	...do.....	Greensboro.....	6.17	7.50	6.28	7.64
14	...do.....	Sylva.....	6.17	7.50	6.44	7.83
17	...do.....	Wadesboro.....	6.17	7.50	6.48	7.88
1299	...do..... Maxton, N. C.....	Dunn.....	6.17	7.50	5.88	7.15
6	...do.....	Dunn.....	6.17	7.50	5.92	7.20
1428	Farmers Cotton Oil Co., Wilson, N. C.....	Lucama.....	6.17	7.50	4.94	6.01
1421	...do.....	Lucama.....	6.17	7.50	5.10	6.20
1045	...do.....	Greenville.....	6.17	7.50	5.84	7.10
1044	...do.....	Greenville.....	6.17	7.50	5.92	7.20
1043	...do.....	Williamston.....	6.17	7.50	5.72	6.95
963	...do.....	Williamston.....	6.17	7.50	5.88	7.15
959	...do.....	Williamston.....	6.17	7.50	4.92	5.98
958	...do.....	Williamston.....	6.17	7.50	4.94	6.01
964	...do.....	Williamston.....	6.17	7.50	5.84	7.10
1081	...do.....	Wilson.....	6.17	7.50	5.08	6.18
1180	...do.....	Snow Hill.....	6.17	7.50	5.38	6.54
1181	...do.....	Wilson.....	6.17	7.50	5.84	7.10
3	...do.....	Clinton.....	6.17	7.50	5.32	6.47
1	...do.....	Goldsboro.....	6.17	7.50	5.58	6.78
1040	Fremont Oil Mill Co., Fremont, N. C.....	Mount Olive.....	6.17	7.50	5.52	6.71
1041	...do.....	Mount Olive.....	6.17	7.50	4.88	5.93
951	...do.....	Mount Olive.....	6.17	7.50	5.46	6.64
1407	Havens Oil Co., Wilmington, N. C.....	Williamston.....	6.17	7.50	6.40	7.78
988	Humphreys-Godwin Co., Memphis, Tenn.....	Nashville.....	6.17	7.50	6.22	7.56
1400	Kershaw Oil Mill Co., Kershaw, S. C.....	Tryon.....	6.17	7.50	6.04	7.34
1024	Lenoir Oil and Ice Co., Kinston, N. C.....	Kinston.....	6.17	7.50	5.40	6.57
1381	...do.....	Trenton.....	6.17	7.50	4.80	5.84
1062	Lillington Oil Mill Co., Lillington, N. C.....	Linden.....	6.17	7.50	5.94	7.22

II. ANALYSES COTTON SEED MEAL.

Laboratory Number	Name and Address of Manufacturer	Where Sampled	Per Cent Nitrogen Guaranteed	Equivalent to Ammonia	Per Cent Nitrogen Found	Equivalent to Ammonia
1063	Lillington Oil Mill Co., Lillington, N. C.....	Linden.....	6.17	7.50	6.30	7.66
1061	do.....	Linden.....	6.17	7.50	6.18	7.51
1021	do.....	Duke.....	6.17	7.50	6.08	7.39
1022	do.....	Duke.....	6.17	7.50	6.24	7.59
996	do.....	Farmville.....	6.17	7.50	5.82	7.08
1179	do.....	Snow Hill.....	6.17	7.50	5.92	7.20
1433	do.....	Smithfield.....	6.17	7.50	5.72	6.95
1429	do.....	Four Oaks.....	6.17	7.50	5.58	6.78
1436	do.....	Bunn Level.....	6.17	7.50	6.10	7.42
1165	Louisburg Cotton Oil Co., Louisburg, N. C.....	Franklinton.....	6.17	7.50	5.64	6.86
1020	Laurinburg Oil Co., Laurinburg, N. C.....	Laurinburg.....	6.17	7.50	5.90	7.17
1368	Lovitt, L. B., & Co., Memphis, Tenn.....	Williamston.....	6.17	7.50	6.30	7.66
1369	do.....	Williamston.....	6.17	7.50	6.06	7.37
1378	do.....	Williamston.....	6.17	7.50	5.96	7.25
1312	do.....	Williamston.....	6.17	7.50	6.22	7.56
1012	Memphis Cotton, Hull, and Fibre Co., Memphis, Tenn.	Mount Olive.....	6.17	7.50	3.22	3.91
1177	Morgan Oil and Fertilizer Co., Red Springs, N. C..	Fayetteville.....	6.17	7.50	5.72	6.95
1392	Pine Level Oil Mill, Pine Level, N. C.....	Princeton.....	6.17	7.50	5.46	6.64
1171	Raleigh Cotton Oil Co., Raleigh, N. C.....	Garner.....	6.17	7.50	5.14	6.25
8	do.....	Benson.....	6.17	7.50	5.76	7.00
998	do.....	Raleigh.....	6.17	7.50	5.18	6.30
1000	do.....	Garner.....	6.17	7.50	5.66	6.88
1197	Robeson Manufacturing Co., Lumberton, N. C....	Lumberton.....	6.17	7.50	6.40	7.78
1300	do.....	St. Paul.....	6.17	7.50	5.92	7.20
1299	do.....	St. Paul.....	6.17	7.50	6.22	7.56
1298	do.....	St. Paul.....	6.17	7.50	6.12	7.44
1321	do.....	Tar Heel.....	6.17	7.50	6.10	7.42
1328	do.....	Fayetteville.....	6.17	7.50	5.52	6.71
1275	do.....	Fayetteville.....	6.17	7.50	5.70	6.93
1274	do.....	Fayetteville.....	6.17	7.50	5.78	7.03
1229	Royster, F. S., Guano Co., Norfolk, Va.	Fayetteville.....	6.17	7.50	6.40	7.78
1163	Smith, W. Newton, Baltimore, Md.....	Oxford.....	6.17	7.50	3.20	3.89
1036	do.....	Princeton.....	6.17	7.50	3.20	3.89
1150	do.....	Princeton.....	6.17	7.50	5.48	6.66
1066	Southern Cotton Oil Co., Fayetteville, N. C.....	Hope Mills.....	6.17	7.50	6.12	7.44
1060	do.....	Parkton.....	6.17	7.50	5.82	7.08
1067	do.....	Hope Mills.....	6.17	7.50	6.00	7.29
1063	do.....	Hope Mills.....	6.17	7.50	6.18	7.51

II. ANALYSES COTTON SEED MEAL.

Laboratory Number	Name and Address of Manufacturer	Where Sampled	Per Cent Nitrogen Guaranteed	Equivalent to Ammonia	Per Cent Nitrogen Found	Equivalent to Ammonia
1069	Southern Cotton Oil Co., Fayetteville, N. C.....	Hope Mills.....	6.17	7.50	5.94	7.22
1070	...do.....	Hope Mills.....	6.17	7.50	5.92	7.20
1018	...do.....	Parkton.....	6.17	7.50	5.92	7.20
1277	...do.....	Fayetteville.....	6.17	7.50	5.74	6.98
1278	...do.....	Fayetteville.....	6.17	7.50	5.74	6.98
1327	...do.....	Fayetteville.....	6.17	7.50	5.66	6.88
1295	...do.....	Lena.....	6.17	7.50	5.98	7.27
1151	...do.....	Hope Mills.....	6.17	7.50	5.90	7.17
1158	...do.....	Hope Mills.....	6.17	7.50	5.80	7.05
1159	...do.....	Hope Mills.....	6.17	7.50	5.78	7.03
1160	...do.....	St. Paul.....	6.17	7.50	5.82	7.08
1161	...do.....	St. Paul.....	6.17	7.50	6.02	7.32
1162	...do.....	Hope Mills.....	6.17	7.50	5.94	7.22
1132	...do.....	Hope Mills.....	6.17	7.50	6.02	7.32
1147	...do.....	Hope Mills.....	6.17	7.50	5.82	7.08
1017	...do..... Rocky Mount, N. C.....	Enfield.....	6.17	7.50	5.42	6.59
1297	...do..... Selma, N. C.....	Kenly.....	6.17	7.50	5.92	7.20
1152	...do.....	Smithfield.....	6.17	7.50	5.82	7.08
1174	...do..... Wadesboro, N. C.....	Morven.....	6.17	7.50	5.38	6.54
1424	...do..... Wilson, N. C.....	Kenly.....	6.17	7.50	5.80	7.05
5	...do.....	Elm City.....	6.17	7.50	5.46	6.64
1170	Taylor Commission Co., Atlanta, Ga.....	Garner.....	6.17	7.50	5.64	6.86
1376	Union Seed and Fertilizer Co., Henderson, N. C.....	Williamston.....	6.17	7.50	6.04	7.34
1220	...do.....	Weldon.....	6.17	7.50	5.80	7.05
1149	...do..... Memphis, Tenn.....	Smithfield.....	6.17	7.50	3.30	4.01
1138	...do..... Raleigh, N. C.....	Williamston.....	6.17	7.50	6.00	7.29
2	...do..... Wilmington, N. C.....	Warsaw.....	6.17	7.50	5.18	6.30
1050	...do.....	Clarkton.....	6.17	7.50	6.02	7.32
1377	Valley Cotton Oil Co., Memphis, Tenn.....	Williamston.....	6.17	7.50	5.70	6.93
1139	...do.....	Williamston.....	6.17	7.50	6.24	7.59
1375	...do.....	Williamston.....	6.17	7.50	6.06	7.37
4	Zebulon Cotton Oil Co., Zebulon, N. C.....	Elm City.....	6.17	7.50	6.02	7.32

LEAF TOBACCO REPORT FOR AUGUST, 1917

Pounds sold for producers.....	21,315,706
Pounds sold for dealers.....	500,518
Pounds sold for warehouses.....	841,676
Total	<hr/> 22,657,900

LEAF TOBACCO REPORT FOR SEPTEMBER, 1917

Pounds sold for producers.....	77,959,884
Pounds sold for dealers.....	2,779,513
Pounds sold for warehouses.....	4,067,303
Total	<hr/> 84,806,700

THE BULLETIN
OF THE
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DEPARTMENT OF AGRICULTURE
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Whole No. 238

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*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

LETTER OF TRANSMITTAL

HON. W. A. GRAHAM,
Commissioner of Agriculture.

SIR:—I submit herewith manuscript covering the inspection and analysis of concentrated stock feeds during the past year. I recommend its publication as the November BULLETIN.

Very respectfully,

B. W. KILGORE,
State Chemist.

Approved for printing:
W. A. GRAHAM, *Commissioner.*

COMMERCIAL FEEDS, 1917

J. M. PICKEL, Feed Chemist.*


Five hundred and fifteen samples of feeds have been analyzed since those accounted for in the BULLETIN for 1916. Three hundred and seventy-four of these samples were collected by the official feed inspector in various cities and towns throughout the State. One hundred and forty-one samples were sent in by citizens of the State (merchants, manufacturers, dairymen, and other consumers).

The analyses of three hundred and eighty-eight of these samples are published in this BULLETIN.

IMMEDIATELY ESSENTIAL POINTS OF THE NORTH CAROLINA FEEDING STUFFS LAW

All feeds for live stock and poultry, except hays, straws, and corn stover, when the same are not mixed with other materials, and except the whole seeds or grains of cereals when not mixed with other materials, must be registered and guaranteed; and each bag of such a feed must carry a guarantee tag and tax stamp at the rate of 1 cent per 100 lbs. Instead of a tag, the guarantee may be printed on the bag.

Feeds must be put up in 25 lb., 50 lb., 75 lb., 100 lb. bags. Tax stamps are to be had from the Commissioner of Agriculture in denominations of $\frac{1}{4}$ c., $\frac{1}{2}$ c., $\frac{3}{4}$ c., 1c., etc.

 (STAMP TO GO HERE)	100 POUNDS	MU-HO-CO FEED	MANUFACTURED BY	JOHN JONES & CO.	RALEIGH, N. C.	GUARANTEED	PROTEIN (minimum) ..13.0..... Per Cent
							FAT (minimum).....3.5..... Per Cent
							FIBER (maximum) .....11.5..... Per Cent
							CARBOHYDRATES .....55.0..... Per Cent
							INGREDIENTS: — Ground Alfalfa, Corn, Oats, Wheat Bran, Cotton-seed Meal, Ground Screen- ings.
							SPECIMEN GUARANTEED TAG

Each Ingredient of a feed must be stated specifically by its name.

Screenings must be ground to destroy the viability of weed seeds.

Cotton-seed Meal must contain not less than 33.44 per cent of protein, equivalent to 6.5 per cent ammonia. Mixtures of meal and hulls con-

*The protein determinations were made by Messrs. B. B. Brandt and E. S. Dewar.

taining less than the above must be sold as cotton-seed feed or under a name not containing the word meal.

Penalties.—Persons violating the law are subject to a fine of \$50 to \$200 for each offense, and feeds which do not meet the requirements are subject to seizure, condemnation, and sale.

Copies of the law may be had on application.

LOW GRADE BY-PRODUCTS IN MIXED FEEDS

In view of the decision of the Federal courts, the use of oat hulls, cotton-seed hulls, peanut hulls, corn cobs, and similar materials, will be permitted in mixed feeds in North Carolina when feeds are kept up to the standard in composition adopted by the Department, and when the presence of these materials is declared on the tag or bag, and when they are used in such a way as not to deceive the purchaser.

TEN AND NINE PER CENT MINIMUM PROTEIN

Mixed feeds containing any one or more of the above by-products or similar ones of low feeding value, such as straws, chaffs, cornstalk, corn pith, sorghum pulp, grain screenings and many others that will occur to the mind of the feed mixer must carry a minimum of 10 per cent protein.* Mixed feeds which do not contain low grade ingredients such as the above and similar ones must carry 9 per cent minimum protein. *Nine per cent* protein is the minimum protein under any circumstances in mixed feeds.

NITROGEN, AMMONIA, AND PROTEIN EQUIVALENTS

The ammonia per cent multiplied by 5.14 gives the protein per cent.

The nitrogen per cent multiplied by 6.25 gives the protein per cent.

The nitrogen per cent multiplied by 1.216 gives the ammonia per cent.

HEARINGS

When a sample of commercial feed examined shows variation from the guarantees, the dealer or manufacturer from whom the sample was taken shall be given an opportunity to be heard in his defense by the Commissioner before the facts may be certified to the proper prosecuting attorney.

It is the duty of the Department of Agriculture to regularly inspect the feeds offered for sale in the State and to see that all feeds bear the tax stamp and are properly labeled. The Department is required to collect and analyze at least one sample of every brand of feed found on sale in the State during the year and to publish the results for the benefit of those interested in this class of goods.

The Department will be glad, at any time, to furnish information regarding the character and value of any class of feed.

*Poultry feeds containing grit included in this class.

DEFINITIONS ESPECIALLY IMPORTANT TO MILLERS

The Association of Feed Control Officials in coöperation with The American Feed Manufacturers' Association has adopted definitions for almost all varieties of feeding stuffs. If all manufacturers would follow these definitions in naming their products, much confusion and misunderstanding would be avoided. A few of these definitions of special interest to millers are subjoined:

Wheat Bran is the coarse outer coatings of the wheat berry obtained in the usual commercial milling process from wheat that has been cleaned and scoured.

Shorts or Standard Middlings are the fine particles of the outer and inner bran separated from bran and white middlings.

Wheat White Middlings or White Middlings are that part of the offal of wheat intermediate between shorts or standard middlings and red dog.

Shipstuff or Wheat Mixed Feed is a mixture of the products other than the flour obtained from the milling of the wheat berry.

Red Dog is a low grade wheat flour containing the finer particles of bran.

Wheat Bran with Mill Run Screenings is pure wheat bran plus the screenings which were separated from the wheat used in preparing said bran.

Wheat Bran with Screenings not Exceeding Mill Run is either wheat bran with the whole mill run of screenings or wheat bran with a portion of the mill run of screenings, provided that such portion is not an inferior portion thereof.

Meal is the clean, sound, ground product of the entire grain, cereal or seed which it purports to represent.

Chop is a ground or chop feed composed of one or more different cereals or by-products thereof. If it bears a name descriptive of the kind of cereals, it must be made exclusively of the entire grains of those cereals.

Screenings are the smaller imperfect grains, weed seeds and other foreign material having feeding value, separated in cleaning the grain.

Cotton-seed Feed.—All mixtures of cotton-seed meal and hulls containing less than 33.44 per cent protein shall be branded Cotton-seed Feed, or a name may be given which does not contain the word "meal" or any other word that might be misleading.

Millers are especially requested to note: •

- (1) That *Shipstuff* is a pure wheat product.
- (2) That *Shorts* and *Middlings* are two names for the same thing.
- (3) That when *Screenings* are run in with bran, middlings, shipstuff, the resulting product is no longer bran, middlings, or shipstuff, and should not be so designated; but is a *mixture*, and should be designated

*See page nine.

so as to make that clear, thus: Wheat Bran and Screenings, Shipstuff and Screenings, or Wheat Bran with Mill Run Screenings, Wheat Bran with Screenings, not exceeding Mill Run.

(4) That *Screenings* should always be ground to destroy the viability of weed seeds. Weed seeds are usually so small and so hard that they pass through the alimentary canal undigested and become disseminated in dung over the fields to the detriment of both farmer and miller.

TERMS USED IN ANALYSIS

Ash. This is the incombustible part of the plant, earthy matter drawn from the soil by the plants, and taken over into the animal organism from plants.

Protein. This is the nitrogenous portion of the plant. Lean meat, white of eggs, curd of milk, gluten of grain are examples.

Fiber. The frame-work of the plant; trunk and stem are hardened fiber mixed with mineral and other matter; cotton is almost pure fiber.

Fat. The portion of plant soluble in ether is classed as fat, but includes small quantity of substances other than fats. Cotton-seed oil, olive oil, peanut oil, the oils of cereals are examples. Tallow, lard, butter and the various animal oils and fats fall into this class.

Nitrogen-free Extract. Starch, the various sugars, gums are examples.

Carbohydrates. This is a general term, including fiber and nitrogen-free extract.

ANIMAL FEEDING AND NUTRITION

A fundamental distinction between plants and animals is this: Plants manufacture, so to speak, foods; animals consume, but cannot manufacture, food. They merely transform—more or less modify—the food they get from plants, utilize it for their own growth and maintenance and for doing work, or else store it up in their bodies, or as in the case of milk, excrete it.

Animals get the mineral matter for forming bone from plants, a small portion also from water. The function of the carbohydrates and fats in animal nutrition is the production of warmth and energy; for this purpose fat has two and four-tenths the value of carbohydrate pound for pound. The function of protein is to build up, repair and sustain the vital portions of the animal organism—blood, muscle, nerve, brain; the fats and carbohydrates cannot do this. Protein is capable also of being oxidized, or burned, in the body and producing warmth and energy; and in the absence of adequate fats and carbohydrates is thus utilized; but this is, besides being extravagant, unwholesome. A well balanced ration is one that contains protein, fat, carbohydrate in proper proportion to meet the needs of the animal. These needs vary with the kind of animal, its age and uses.

The following are excellent hand-books on animal feeding and nutrition:—

“Feeds and Feeding” by Henry and Morrison; “Profitable Stock Feeding” by Prof. H. W. Smith; “Manual of Cattle Feeding,” by Prof. H. P. Armsby; “The Feeding of Animals” by W. H. Jordan.

COTTON-SEED MEAL

The General Assembly of North Carolina, session of 1917, enacted a new cotton-seed meal law. Three grades of cotton-seed meal, *Prime*, *Good*, and *Ordinary*, are specified. Sections 2 and 3 read:

SEC. 2. That all cotton-seed meal offered for sale, unless sold to manufacturers for use in manufacturing fertilizers or feed, shall have plainly branded on the bag containing it, or on the tag attached thereto, the following data:

1. Cotton-seed meal (with brand and grade).
2. Weight of package.
3. Ammonia and protein.
4. Name and address of manufacturer.

SEC. 3. That no persons, firm, or corporation shall offer for sale any cotton-seed meal, except as provided in section two of this act, graded and classed as follows:

1. Prime cotton-seed meal by analysis must contain at least seven and one-half per cent of ammonia or thirty-eight and fifty-six hundredths per cent of protein.
2. Good cotton-seed meal by analysis must contain at least seven per cent of ammonia or thirty-six and no one-hundredths per cent of protein.
3. Ordinary cotton-seed meal by analysis must contain at least six and one-half per cent of ammonia or thirty-three and forty-four hundredths per cent of protein.

Nothing in section 2 prohibits giving, in addition to the data there required, the per cent of fat, fiber, and carbohydrates; and this additional data should be given for the benefit of feeders. Cotton-seed meal, whether sold as fertilizer or feed, is subject to inspection tax of 20 cents per ton.

ANALYSES OF SAMPLES WHEAT BRAN WITH AND

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price of Package
1205	Pure Wheat Bran.....	The Acme Mills, Hopkinsville, Ky.	Adams Grain and Prov. Co., Asheville.	Feb. 16, '17	75	\$ 1.60
1220	do.....	Asheville Milling Corporation, Asheville, N. C.	Asheville Milling Corporation, Asheville.	Feb. 17, '17	75	1.60
1157	do.....	Dan Valley Milling Co., Danville, Va.	Merchants Supply Co., Burlington.	Dec. 8, '16	100	1.85
1135	Wheat Bran and Screenings.	Dunlop Milling Co., Clarksville, Tenn.	Charles P. Moody Co., Charlotte.	Dec. 12, '16	75	1.50
1236	do.....	do.....	Elmore Maxwell Co., Greensboro.	Feb. 27, '17	100	2.15
1252	do.....	do.....	H. L. Bizzell, Goldsboro.	Feb. 28, '17	100	2 10
1244	do.....	do.....	M. J. Best, Goldsboro.	Feb. 28, '17	100	2.10
1433	do.....	do.....	Sanford Grain and Prov. Co., Sanford.	May 3, '17	100	2.75
1446	do.....	do.....	Siler Bros., Raleigh.	May 17, '17	100	*47.00
1455	do.....	do.....	Carpenter Bros., Durham.	May 22, '17	100	2.50
1406	do.....	B. A. Eckhart Milling Co., Chicago, Ill.	C. L. Spencer, New Bern.	Mar. 13, '17	100	2.50
1281	Choice Bran and Screenings.	Hecker-Jones-Jewell Milling Co., New York.	B. F. Mitchell Co., Wilmington.	Mar. 9, '17	100	2.00
1288	do.....	do.....	McNair & Pearsall, Wilmington.	Mar. 9, '17	100	2.15
1519	Anchor Bran and Screenings.	Kemper Mill and Elevator Co., Kansas City, Mo.	American Feed Milling Co., Asheville.	Sept. 11, '17	75	1.65
1138	Wheat Bran.....	Morristown Flour Mills, Morristown, Tenn.	Farmers Supply Co., Dallas.	Dec. 13, '16	75	1.60
1167	do.....	do.....	City Feed Co., Hickory.	Dec. 19, '16	75	1.50
1210	do.....	do.....	J. D. Earle Feed Co., Asheville.	Feb. 17, '17	75	1.55
1133	Pure Wheat Bran and Screenings.	Liberty Mills, Nashville, Tenn.	Davidson & Wolf, Charlotte.	Dec. 12, '16	75	1.50
1172	do.....	do.....	J. O. Plott, Canton.	Dec. 19, '16	75	*36.00
1238	do.....	do.....	Elmore Maxwell Co., Greensboro.	Feb. 27, '17	100	2.15
1441	do.....	do.....	Marion Cash Feed Store, Marion.	May 8, '17	100	2.50
1445	do.....	do.....	Siler Bros. Co., Raleigh.	May 17, '17	100	*47.00
1492	do.....	do.....	Southern Grocery Co., Durham.	June 5, '17	100	2.30
1504	do.....	do.....	G. C. Lovett Co., Mount Airy.	June 19, '17	100	2.15
1089	Pure Wheat Bran.....	Piedmont Mills, Lynchburg, Va.	Garrett & McNeil, Red Springs.	Nov. 23, '16	100	1.75
1270	Wheat Bran.....	Pillsbury Flour Mills, Minneapolis, Minn.	Hall & Pearsall, Wilmington.	Mar. 8, '17	100	2.20

*Per ton.

OF FEEDS, SEASON 1916-1917

WITHOUT SCREENINGS

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1205	Guaranteed..	14.5		4.0		9.5		Pure wheat bran.
	Found.....	14.6	.1	4.4	.4	9.5	.0	
1220	Guaranteed..	14.5		4.0		9.5		Pure wheat products.
	Found.....	16.6	2.1	4.7	.7	5.3	4.2	
1157	Guaranteed..	14.5		4.0		9.5		Pure wheat bran.
	Found.....	14.5	.0	4.8	.8	10.1	1.6	
1135	Guaranteed..	14.8		4.0		9.5		Wheat bran, wheat screenings.
	Found.....	14.0	— .8	4.5	.5	9.7	.2	
1236	Guaranteed..	14.8		4.0		9.5		do.
	Found.....	15.0	.2	4.3	.3	8.7	— .8	
1252	Guaranteed..	14.8		4.0		9.5		do.
	Found.....	14.2	— .6	4.1	.1	9.2	— .3	
1244	Guaranteed..	14.8		4.0		9.5		do.
	Found.....	15.0	.2	4.4	.4	9.1	— .4	
1433	Guaranteed..	14.8		4.0		9.5		do.
	Found.....	15.0	.2	4.5	.5	8.6	— .9	
1446	Guaranteed..	14.8		4.0		9.5		do.
	Found.....	15.1	.3	4.2	.2	8.2	— 1.3	
1455	Guaranteed..	14.8		4.0		9.5		do.
	Found.....	15.3	.5	4.0	.0	7.6	— 1.9	
1406	Guaranteed..	14.0		4.0		11.0		Wheat bran, ground re-cleaned wheat screenings not exceeding mill-run.
	Found.....	14.3	.3	4.0	.0	8.7	— 2.3	
1281	Guaranteed..	14.3		4.0		11.0		Wheat bran, mill-run screenings.
	Found.....	15.0	.7	4.6	.6	8.9	— 2.1	
1288	Guaranteed..	14.3		4.0		11.0		do.
	Found.....	14.4	.1	4.5	.5	8.7	— 2.3	
1519	Guaranteed..	14.5		4.0		10.0		Wheat bran, ground screenings not exceeding mill-run.
	Found.....	16.0	1.5	4.1	.1	8.2	— 1.8	
1138	Guaranteed..	14.5		4.0		9.5		Pure wheat products.
	Found.....	15.1	.6	4.5	.5	8.5	— 1.0	
1167	Guaranteed..	14.5		4.0		9.5		do.
	Found.....	15.4	.9	4.2	.2	8.9	— .6	
1210	Guaranteed..	14.5		4.0		9.5		do.
	Found.....	15.0	.5	4.3	.3	8.8	— .7	
1133	Guaranteed..	14.5		4.0		9.5		Pure wheat bran only, with screenings incident to milling.
	Found.....	15.9	1.4	4.3	.3	8.0	— 1.5	
1172	Guaranteed..	14.5		4.0		9.5		do.
	Found.....	15.9	1.4	3.6	— .4	8.7	— .8	
1238	Guaranteed..	14.5		4.0		9.5		do.
	Found.....	12.9	— 1.6	3.7	— .3	10.2	.7	
1441	Guaranteed..	14.5		4.0		9.5		Made from pure wheat only, with screenings in- cident to milling.
	Found.....	13.5	— 1.0	3.9	— .1	9.1	— .4	
1445	Guaranteed..	14.5		4.0		9.5		do.
	Found.....	14.0	— .5	3.8	— .2	8.6	— .9	
1492	Guaranteed..	14.5		4.0		9.5		do.
	Found.....	13.7	— .8	4.1	.1	9.3	— .2	
1504	Guaranteed..	14.5		4.0		9.5		do.
	Found.....	13.9	— .6	4.2	.2	10.7	1.2	
1089	Guaranteed..	14.5		4.0		9.5		
	Found.....	14.9	.4	4.7	.7	8.9	— .6	
1270	Guaranteed..	13.0		4.0		13.0		Wheat bran and screenings.
	Found.....	14.4	1.4	4.7	.7	11.1	— 1.9	

WHEAT BRAN WITH AND

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1293	Wheat Bran.....	Pillsbury Flour Mills, Minneapolis, Minn.	S. P. McNair, Wilmington.	Mar. 9, '17	100	\$ 2.15
1400	do.....	do.....	John S. McEachers Sons, Wilmington.	Mar. 10, '17	100	2.25
1500	do.....	Southside Roller Mills, Winston-Salem, N. C.	J. E. Cox, Winston-Salem.		100	2.25
1096	do.....	J. I. Triplett, Woodstock, Va.	A. E. Rankin & Co., Fayetteville.	Nov. 24, '16	100	2.00
1224	Pure Wheat Bran.....	J. M. Veach Co., Adairsville, Ga.	Wofford-Terrell Co., Murphy.	Feb. 19, '17	75	1.65
1101	do.....	do.....	Wofford-Foin Co., Murphy.	Nov. 30, '16	75	-----
1466	Wheat Bran.....	Washburn-Crosby Co., Minneapolis, Minn.	Landis Grocery Co., Henderson.	May 23, '17	100	2.85
1111	Pure Wheat Bran.....	Ballard & Ballard, Louisville, Ky.	W. J. Snow, Elkin.....	Dec. 5, '15	100	2.00

WHEAT MIDLINGS (OR SHORTS)

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1221	Pure Wheat Shorts.....	Asheville Milling Corp., Asheville, N. C.	Asheville Milling Corp., Asheville.	Feb. 17, '17	75	\$ 1.70
1208	Pure Wheat Bran Middlings.	Dunlop Milling Co., Clarksville, Tenn.	Adams Grain and Prov. Co., Asheville.	Feb. 16, '17	75	1.75
1228	do.....	do.....	Slayden-Fakes Co., Asheville.	Feb. 21, '17	75	1.70
1229	Pure Wheat Middlings.....	do.....	Shuping & Poteat, Morganton.	Feb. 22, '17	75	1.75
1257	Pure Wheat Bran Middlings.	do.....	Adams Grain and Prov. Co., Fayetteville.	Mar. 6, '17	75	1.80
1434	Pure Wheat Middlings.....	do.....	Sanford Grain and Prov. Co., Sanford.	May 3, '17	100	2.75
1485	do.....	do.....	Blair & Co., No. Wilkesboro.	June 1, '17	100	2.75
1494	Wheat Middlings and Screenings.	Eagle Roller Mills, New Ulm, Minn.	Southern Grocery Co., Durham.	June 5, '17	100	2.55
1085	Middlings and Screenings.	B. A. Eckhart Milling Co., Chicago, Ill.	Red Springs Trading Co., Red Springs.	Nov. 23, '16	100	2.30
1415	Pure Wheat White Middlings.	C. A. Gambrill Mfg. Co., Baltimore, Md.	Peacock Grocery Co., Wilson.	Mar. 14, '17	75	2.00
1423	do.....	do.....	Woodard Bros., Wilson.	Mar. 14, '17	75	2.00
1419	do.....	do.....	Wells Grocery Co., Wilson.	Mar. 14, '17	75	2.25
1435	Triangle Bran and Shorts.	Interstate Milling Co., Charlotte, N. C.	Sanford Grain and Prov. Co., Sanford.	May 3, '17	100	2.75

WITHOUT SCREENINGS—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1293	Guaranteed..	13.0		4.0		13.0		Wheat bran and screenings.
	Found.....	14.3	1.3	4.6	.6	10.7	— 2.3	
1400	Guaranteed..	13.0		4.0		13.0		do.
	Found.....	14.8	1.8	4.6	.6	11.2	— 1.8	
1500	Guaranteed..	14.5		4.0		6.5		
	Found.....	14.5	.0	4.0	-----	8.2	1.7	
1096	Guaranteed..	15.0		4.0		9.0		
	Found.....	14.5	— .5	4.1	.1	9.3	.3	
1224	Guaranteed..	14.5		4.0		9.5		
	Found.....	14.7	.2	4.2	.2	7.6	— 1.9	
1101	Guaranteed..	14.5		4.0		9.5		
	Found.....	17.1	2.6	4.5	.5	7.7	— 1.8	
1466	Guaranteed..	13.0		4.0		13.0		
	Found.....	14.0	1.0	4.5	.5	10.3	— 2.7	
1111	Guaranteed..	15.8		4.4		8.0		
	Found.....	13.7	— 2.1	4.6	.2	9.8	1.8	

WITH AND WITHOUT SCREENINGS

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1221	Guaranteed..	15.0		4.0		6.0		Made from pure wheat only.
	Found.....	16.1	1.1	3.9	— .1	2.8	3.2	
1208	Guaranteed..	16.3		4.6		6.0		do.
	Found.....	16.0	— .3	4.2	— .4	4.9	— 1.1	
1228	Guaranteed..	16.3		4.6		6.0		do.
	Found.....	16.1	— .2	4.5	— .1	5.6	.4	
1229	Guaranteed..	16.3		4.6		6.0		Pure wheat product.
	Found.....	16.0	.3	4.2	— .4	5.9	— .1	
1257	Guaranteed..	16.3		4.6		6.0		Made from pure wheat.
	Found.....	14.4	— 1.9	3.5	— 1.1	5.2	— .8	
1434	Guaranteed..	16.0		4.3		6.0		Made from pure wheat product.
	Found.....	14.9	— 1.1	4.1	— .2	4.9	— 1.1	
1485	Guaranteed..	16.0		4.3		6.0		do.
	Found.....	16.5	.5	4.4	.1	5.6	— .4	
1494	Guaranteed..	16.0		4.4		8.0		
	Found.....	17.5	1.5	4.7	.3	5.5	— 2.5	
1085	Guaranteed..	14.0		4.0		7.0		Middlings and ground screenings not exceeding mill-run.
	Found.....	17.6	3.6	4.3	.3	6.7	— .3	
1415	Guaranteed..	16.5		5.0		3.3		
	Found.....	15.5	— 1.0	4.8	— .2	4.6	1.3	
1423	Guaranteed..	16.5		5.0		3.3		
	Found.....	15.4	— 1.1	4.5	— .5	4.2	.9	
1419	Guaranteed..	16.5		5.0		3.3		
	Found.....	14.3	— 2.2	3.9	— 1.1	4.3	1.0	
1435	Guaranteed..	15.5		4.0		7.0		Wheat bran, wheat shorts, wheat screenings.
	Found.....	14.7	— .8	4.9	.9	6.6	— .4	

WHEAT MIDLINGS (OR SHORTS) WITH

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1487	Pure Wheat Middlings-----	Igleheart Bros., Evans- ville, Ind.	Blair & Co., No. Wilkes- boro.	June 1, '17	100	\$ 2.85
1141	Wheat Shorts and Screen- ings.	H. L. Halliday Milling Co., Cairo, Ill.	Adams Grain and Prov. Co., Charlotte.	Dec. 14, '16	75	1.50
1278	Wheat Middlings-----	Hecker-Jones-Jewell Mill- ing Co., New York, N.Y.	D. L. Gore Co., Wilmington	Mar. 9, '17	100	2.20
1143	Pure Wheat Middlings-----	Jefferson Milling Co., Charlestown, W. Va.	Adams Grain and Prov. Co., Charlotte.	Dec. 14, '16	100	2.20
1484	Liberty Shorts-----	Liberty Mills, Nashville, Tenn.	Blair & Co., No. Wilkes- boro.	June 1, '17	100	2.75
1518	---do-----	---do-----	Adams Grain and Prov. Co., Asheville.	Sept. 11, '17	75	2.00
1166	Rich Middlings-----	Model Mill Co., Johnson City, Tenn.	City Feed Co., Hickory---	Dec. 19, '16	75	1.75
1245	Bran Shorts-----	---do-----	L. A. Raney Co., Golds- boro.	Feb. 28, '17	100	2.25
1115	Pure Wheat Shorts-----	Middle Tenn. Milling Co., Tullahoma, Tenn.	Caudell Feed Co., No. Wilkesboro.	Dec. 5, '16	100	2.25
1092	Wheat Standard Middlings	Northwestern Cons. Milling Co., Minneapolis, Minn	Armfield Co., Fayetteville.	Nov. 23, '16	100	2.00
1113	Wheat Middlings-----	Page Milling Co., Luray, Va.	Pearson Bros , No. Wilkes- boro.	Dec. 5, '16	100	2.25
1261	Durum Standard Wheat Middlings.	Pillsbury Flour Mills Co., Minneapolis, Minn.	Armfield Co., Fayetteville.	Mar. 6, '17	100	2.10
1243	Standard Wheat Middlings	---do-----	M. J. Best & Sons, Golds- boro.	-----	100	2.00
1239	---do-----	---do-----	B. G. Thompson & Sons, Goldsboro.	Feb. 28, '17	100	2.00
1246	Wheat "B" Middlings-----	---do-----	J. T. Grimes Grocery Co., Goldsboro.	Feb. 28, '17	100	2.10
1273	Wheat Middlings-----	---do-----	Pearsall & Co., Wilming- ton.	Mar. 8, '17	100	2.10
1284	Brown Middlings-----	---do-----	B. F. Mitchell Co., Wil- mington.	Mar. 9, '17	100	2.20
1407	Middlings-----	---do-----	C. L. Spencer, New Bern.	Mar. 13, '17	100	2.50
1473	---do-----	---do-----	Eugene Johnston, Little- ton.	May 23, '17	100	2.70
1475	---do-----	---do-----	Weldon Grocery Co., Wel- don.	May 24, '17	100	2.60
1502	XX Daisy-----	---do-----	G. C. Lowell Co., Mount Airy.	June 6, '17	100	2.90
1095	Bixota Middlings-----	Red Wing Milling Co., Red Wing, Minn.	A. E. Rankin Co., Fay- etteville.	Nov. 24, '16	100	2.10
1171	Wheat Shorts and Screen- ings.	Red Star Mill and Elev. Co., Wichita, Kan.	Smathers Grocery Co., Canton.	Dec. 19, '16	---	---
1232	Pure Wheat Shorts-----	Southern Milling Co., Nashville, Tenn.	Kirksey & Gibbs, Morgan- ton.	Feb. 22, '17	75	1.75
1457	Pennant Middlings-----	David Stott Milling Co., Detroit, Mich.	Rose Grocery Co., Dur- ham.	May 22, '17	100	2.60
1137	Pure Wheat Brown Shorts	Southwestern Milling Co., Inc., Kansas City, Mo.	Farmers Supply Co., Dallas	Dec. 13, '16	100	2.35
1090	Star Wheat Middlings....	J. A. Tate & Co., Rich- mond, Va.	Garrett & McNeil, Red Springs.	Nov. 23, '16	100	1.75

AND WITHOUT SCREENINGS—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1487	Guaranteed..	16.0		5.0		7.0		Pure wheat middlings with ground screenings not exceeding mill-run.
	Found.....	15.9	— .1	3.4	— 1.6	4.7	— 2.3	
1141	Guaranteed..	14.5		4.0		9.5		Wheat shorts and screenings.
	Found.....	14.5	.0	4.1	.1	8.4	— 1.1	
1278	Guaranteed..	15.5		4.8		8.0		Made from pure hard wheat.
	Found.....	15.6	.1	4.6	— .2	6.0	— 2.0	
1143	Guaranteed..	15.0		4.0		6.0		Made from pure wheat only.
	Found.....	15.0	.0	4.2	.2	5.2	— .8	
1484	Guaranteed..	15.0		4.0		6.0		do.
	Found.....	15.1	.1	4.3	.3	4.9	— 1.1	
1518	Guaranteed..	15.0		4.0		6.0		do.
	Found.....	16.8	1.8	4.7	.7	5.0	— 1.0	
1166	Guaranteed..	15.0		4.0		7.2		Wheat middlings, wheat shorts, wheat screenings.
	Found.....	15.6	.6	4.7	.7	6.9	— .3	
1245	Guaranteed..	16.0		4.0		6.4		Made from wheat bran and wheat shorts.
	Found.....	14.3	— 1.7	4.5	.5	9.0	2.6	
1115	Guaranteed..	16.0		4.0		6.0		Made from wheat only.
	Found.....	17.7	1.7	4.8	.8	5.8	.2	
1092	Guaranteed..	15.0		4.5		11.0		
	Found.....	15.8	.8	4.5	.0	9.1	— 1.9	
1113	Guaranteed..	15.0		4.0		6.0		Middlings with ground screenings not exceeding mill-run.
	Found.....	15.4	.4	5.3	1.3	3.7	— 2.3	
1261	Guaranteed..	12.5		4.0		11.0		do.
	Found.....	15.6	3.1	6.1	2.1	9.3	— 1.7	
1243	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.9	1.9	4.5	.5	7.5	— 3.5	
1239	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	16.3	2.3	4.8	.8	8.1	— 2.9	
1246	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	16.1	2.1	4.3	.3	9.9	— 1.1	
1273	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.5	1.5	4.8	.8	8.7	— 2.3	
1284	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	16.4	2.4	4.9	.9	8.7	— 2.3	
1407	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.2	1.2	4.7	.7	8.2	— 2.8	
1473	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.9	1.9	4.5	.5	8.2	— 2.8	
1475	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.6	1.6	4.8	.8	8.6	— 2.4	
1502	Guaranteed..	16.0		4.0		4.0		Low grade wheat flour.
	Found.....	16.7	.7	3.7	— .3	2.3	— 1.7	
1095	Guaranteed..	15.4		5.1		9.8		Wheat middlings, low grade flour, wheat screenings, not exceeding mill-run.
	Found.....	17.2	1.8	5.6	.5	7.6	— 2.2	
1171	Guaranteed..	16.0		4.3		5.5		Made from pure wheat only.
	Found.....	17.1	1.1	4.1	— .2	4.3	— 1.2	
1232	Guaranteed..	15.0		4.0		6.0		
	Found.....	17.0	2.0	4.7	.7	5.5	— .5	
1457	Guaranteed..	15.0		4.0		7.0		
	Found.....	14.7	— .3	3.7	— .3	4.7	— 2.3	
1137	Guaranteed..	15.0		4.2		8.0		
	Found.....	16.3	1.3	4.2	.0	6.1	— 1.9	
1090	Guaranteed..	15.0		5.0		9.5		
	Found.....	16.5	1.5	5.1	.1	7.1	— 2.4	

WHEAT MIDLINGS (OR SHORTS) WITH

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed weight of Package-Lbs.	Price of Package
1517	Wheat Shorts.....	Town Creek Milling Co., Lenoir City, Tenn.	Adams Grain and Prov. Co., Asheville.	Sept. 11, '17	75	\$ 2.15
1521	...do.....	...do.....	Asheville Grocery Co., Asheville.	Sept. 11, '17	75	*48.00
1525	...do.....	...do.....	Adams Grain and Prov. Co., Asheville.	Sept. 26, '17	75	*44.50
1444	...do.....	Wright Milling Co., Bluefield, W. Va.	Siler Bros. Co., Raleigh...	May 17, '17	100	*46.00
1110	Wheat Standard Middlings	Washburn-Crosby Co., Minneapolis, Minn.	W. J. Snow, Elkin.....	Dec. 5, '16	100	2.25
1430	...do.....	...do.....	H. C. Edwards, Kinston...	Mar. 28, '17	100	2.45
1451	...do.....	...do.....	Siler Bros. Co., Raleigh...	May 17, '17	100	*50.00
1452	...do.....	...do.....	Carpenter Bros., Durham	May 22, '17	100	2.50
1461	...do.....	...do.....	George A. Rose Co., Henderson.	May 22, '17	100	2.85
1468	...do.....	...do.....	Littleton Feed and Grocery Co., Littleton.	May 23, '17	100	2.75
1476	...do.....	...do.....	Weldon Grocery Co., Weldon.	May 24, '17	100	2.60
1479	...do.....	...do.....	W. J. Snow, Elkin.....	May 31, '17	100	2.85
1511	...do.....	...do.....	Marion Cash Feed Co., Marion.	June 22, '17	100	2.60
1428	Brown Middlings.....	...do.....	Dawson Bros., Kinston...	Mar. 28, '17	100	2.45
1093	Nokomis Middlings.....	Yerxa, Andrews & Thurston, Minneapolis, Minn.	W. F. Smith Co., Fayetteville.	Nov. 24, '16	75	1.60
1258	...do.....	...do.....	...do.....	Mar. 6, '17	75	1.90

*Per ton.

†Found to be adulterated with corn bran.

AND WITHOUT SCREENINGS—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1517	Guaranteed..	16.0		4.0		6.0		Made from wheat product.
	Found.....	14.1	— 1.9	3.5	— .5	7.5	1.5	
1521	Guaranteed..	16.0		4.0		6.0		do.
	Found.....	14.5	— 1.5	3.6	— .4	7.7	1.7	
1525	Guaranteed..	16.0		4.0		6.0		do.
	Found.....	14.7	— 1.3	3.8	— .2	8.4	2.4	
1444	Guaranteed..	14.5		4.0		8.0		Middlings.†
	Found.....	9.9	— 4.6	3.4	— .6	11.9	3.9	
1110	Guaranteed..	14.0		4.0		11.0		Wheat standard middlings with ground screenings not exceeding mill-run.
	Found.....	16.3	2.3	4.7	.7	8.6	— 2.4	
1430	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	16.6	2.6	5.0	1.0	7.3	— 3.7	
1451	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	14.8	.8	4.5	.5	9.1	— 1.9	
1452	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.8	1.8	4.7	.7	8.5	— 2.5	
1461	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	16.0	2.0	4.9	.9	8.1	— 2.9	
1468	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.5	1.5	4.8	.8	8.1	— 2.9	
1476	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	16.3	2.3	4.8	.8	7.8	— 3.2	
1479	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.6	1.6	4.7	.7	8.4	— 2.6	
1511	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.7	1.7	4.4	.4	7.7	— 3.3	
1428	Guaranteed..	14.0		4.0		11.0		do.
	Found.....	15.8	1.8	4.5	.5	7.3	— 3.7	
1093	Guaranteed..	14.5		5.5		10.5		Standard wheat middlings.
	Found.....	16.8	2.3	6.1	.6	7.2	— 3.3	
1258	Guaranteed..	14.5		5.5		10.5		do.
	Found.....	16.5	2.0	4.8	— .7	8.4	— 7.1	

WHEAT BRAN AND MIDLINGS (OR SHORTS)

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1490	Pure Wheat Bran and Shorts.	Acme Mills, Hopkinsville, Ky.	Caudell Feed Co., Wilkesboro.	June 1, '17	100	\$ 2.60
1076	Wheat Bran and Middlings.	Concord Milling Co., Concord, N. C.	L. A. Talbert, Concord.	Nov. 15, '16	100	2.20
1078	do.	Concord Roller Mills, Concord, N. C.	Concord Roller Mills, Concord.	Nov. 15, '16	100	2.20
1077	Pure Wheat Bran, Shorts and Screenings.	China Grove Roller Mills, China Grove, N. C.	L. A. Talbert, Concord.	Nov. 15, '16	100	2.20
1114	Pure Wheat Bran and Shorts.	City Flour Milling Co., Statesville, N. C.	Pearson Bros., No. Wilkesboro.	Nov. 5, '16	75	1.75
1462	Thoroughbred Feed.	Lexington Roller Mills Co., Inc., Lexington, Ky.	George A. Rose & Co., Henderson.	May 23, '17	100	2.85
1439	Bran and Shorts.	Model Mills, Lexington, N. C.	Perry Grocery Co., Lexington.	May 7, '17	-----	-----
1230	Pure Wheat Bran and Shorts.	Morganton Roller Mills, Morganton, N. C.	Kirksey & Gibbs, Morganton.	Feb. 22, '17	75	1.75
1164	Bran and Shorts.	Newport Mill Co., Newport, Tenn.	City Feed Co., Hickory.	Dec. 19, '16	75	1.65
1132	do.	Statesville Flour Mill Co., Statesville, N. C.	Cochran & McLaughlin Co., Charlotte.	Dec. 12, '16	75	1.65
1165	do.	do.	City Feed Co., Hickory.	Dec. 19, '16	75	1.75
1231	Hog Feed.	do.	Kirksey & Gibbs, Morganton.	Feb. 22, '17	75	1.75
1449	do.	do.	Siler Bros., Raleigh.	May 17, '17	100	*50.00
1472	Thoroughbred Feed.	Lexington Roller Mills Co., Lexington, Ky.	Eugene Johnston, Littleton.	May 23, '17	100	2.80

*Per ton.

SHIP

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1418	Shipstuff.	Austin-Heaton Co., Durham, N. C.	P. L. Woodard & Co., Wilson.	Mar. 14, '17	100	\$ 2.40
1413	do.	do.	Peacock Grocery Co., Wilson.	Mar. 14, '17	100	2.25
1424	do.	do.	Lyon-Winston Co., Oxford	-----	100	2.45
1463	do.	do.	Landis Grocery Co., Henderson	May 23, '17	100	2.85
1436	do.	do.	Sanford Grocery Co., Sanford.	May 3, '17	100	2.75
1516	do.	do.	Carpenter Bros., Durham.	Aug. 30, '17	100	2.60

WITH AND WITHOUT SCREENINGS

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1490	Guaranteed..	15.0		4.0		8.5		
	Found.....	15.5	.5	4.2	.2	7.6	— .9	
1076	Guaranteed..	17.5		4.6		7.4		
	Found.....	16.0	— 1.5	4.0	— .6	6.2	— 1.2	
1078	Guaranteed..	17.5		4.6		7.4		
	Found.....	16.4	— 1.1	4.1	— .5	6.1	— 1.3	
1077	Guaranteed..	14.0		3.2		4.9		
	Found.....	15.5	1.5	3.7	.5	5.3	— .4	
1114	Guaranteed..	14.5		4.0		9.5		
	Found.....	14.5	.0	4.3	.3	5.5	— 4.0	
1462	Guaranteed..	15.8		4.1		7.1		
	Found.....	16.1	.3	3.8	— .3	6.7	— .4	Wheat middlings, wheat bran.
1439	Guaranteed..	14.6		4.1		7.1		
	Found.....	14.7	.1	4.2	.1	6.7	— .4	
1230	Guaranteed..	14.0		4.0		7.0		
	Found.....	14.5	.5	3.6	— .4	4.1	— 2.9	
1164	Guaranteed..	14.5		4.0		8.0		
	Found.....	15.1	.6	3.2	— .8	6.4	— 1.6	Wheat middlings, wheat bran, wheat screenings.
1132	Guaranteed..	15.0		4.0		7.5		
	Found.....	15.6	.6	4.3	.3	5.7	— 1.8	Wheat bran and shorts and mill-run screenings.
1165	Guaranteed..	15.0		4.0		7.5		
	Found.....	14.5	— .5	4.0	.0	6.9	— .6	do.
1231	Guaranteed..	15.0		4.0		7.5		
	Found.....	14.7	— .3	4.3	.3	6.6	— .9	do.
1449	Guaranteed..	15.0		4.0		7.5		
	Found.....	14.2	— .8	4.8	.8	6.7	— .8	do.
1472	Guaranteed..	15.8		4.1		7.1		
	Found.....	15.6	— .2	3.8	— .3	6.8	— .3	Wheat middlings and wheat bran.

STUFF

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1418	Guaranteed..	16.0		4.5		5.5		
	Found.....	15.4	— .6	4.4	— .1	6.1	.6	
1413	Guaranteed..	16.0		4.5		5.5		
	Found.....	14.6	— 1.4	4.2	— .3	6.1	.6	
1424	Guaranteed..	16.0		4.5		5.5		
	Found.....	14.3	— 1.7	4.4	— .1	6.1	.6	
1463	Guaranteed..	16.0		4.5		5.5		
	Found.....	14.9	— 1.1	4.1	— .4	6.2	.6	
1436	Guaranteed..	16.0		4.5		5.5		
	Found.....	14.3	— 1.7	3.7	— .8	5.7	.2	
1516	Guaranteed..	16.0		4.5		5.5		
	Found.....	15.6	— .4	3.9	— .6	5.0	— .5	

SHIP

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price of Package
7469	Shipstuff.....	Austin-Heaton Co., Durham, N. C.	Sent by the manufacturer.	Oct. 5, '17	---	\$-----
7292	do.....	do.....	do.....	April 3, '17	---	---
1448	Wheat Feed.....	Atlanta Milling Co., Atlanta, Ga.	Siler Bros. Co., Raleigh....	May 17, '17	100	*51.00
1253	Shipstuff.....	Atlas Flour Mills, Milwaukee, Wis.	H. L. Bizzell, Goldsboro....	Feb. 28, '17	100	2.10
1117	Arrow Shipstuff and Screenings.	Dunlop Mills, Richmond, Va.	Caudill Feed Co., No. Wilkesboro.	Dec. 5, '16	100	2.25
1453	do.....	do.....	Carpenter Bros., Durham	May 22, '17	100	2.60
1155	Pure Wheat Shipstuff....	Dan Valley Mills, Danville, Va.	Merchants Supply Co., Burlington.	Dec. 8, '16	100	2.10
1235	do.....	do.....	Elmore Maxwell Co., Greensboro.	Feb. 27, '17	100	2.20
1153	Shipstuff.....	Hico Milling Co., Burlington, N. C.	C. H. Durham Grocery Co., Burlington.	Dec. 8, '16	100	2.10
1447	Piedmont Shipstuff.....	Piedmont Mills, Lynchburg, Va.	Siler Bros., Raleigh.....	May 17, '17	100	*54.00
1483	Shipstuff.....	do.....	Surry-Wilkes-Yadkin Supply Co., Elkin.	May 31, '17	100	2.85
1499	do.....	Southside Roller Mills, Winston-Salem, N. C.	J. E. Cox, Winston-Salem	-----	100	2.45

*Per ton.

RED

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price of Package
1227	Dandy Red Dog.....	Louisville Milling Co., Louisville, Ky.	Slayden-Fakes Co., Asheville.	Feb. 21, '17	75	\$ 1.75
1482	do.....	do.....	Surry-Wilkes-Yadkin Supply Co., Elkin.	May 31, '17	100	3.10
1128	Bull Red Dog.....	Mayo Milling Co., Inc., Richmond, Va.	Farmers Supply Co., Dallas.	Dec. 13, '17	100	2.90
1421	do.....	do.....	Hadley, Harris & Co., Wilson.	Mar. 14, '17	100	2.50
1442	Comet XXX Red Dog ...	Northwestern Cons. Milling Co., Minneapolis, Minn.	do.....	Mar. 14, '17	100	2.60
1420	do.....	do.....	P. L. Woodard & Co., Wilson.	Mar. 14, '17	100	2.40
1426	do.....	do.....	J. W. Chappell, Creedmoor	-----	100	2.65
1425	do.....	do.....	Creedmoor Supply Co., Creedmoor.	-----	100	2.60

STUFF

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
7469	Guaranteed..	16.0		4.5		5.5		
	Found.....	15.0	— 1.0	4.1	— .4	6.3	.8	
7292	Guaranteed..	16.0		4.5		5.5		
	Found.....	15.5	— .5	4.1	— .4	5.9	.4	
1448	Guaranteed..	14.5		3.7		8.0		
	Found.....	14.4	— .1	4.1	.4	6.9	— 1.1	
1253	Guaranteed..	13.5		3.5		10.5		
	Found.....	14.6	1.1	4.6	1.1	9.0	— 1.5	
1117	Guaranteed..	15.0		4.0		8.0		
	Found.....	15.3	.3	4.2	.2	6.6	— 1.4	
1453	Guaranteed..	15.0		4.0		8.0		
	Found.....	15.1	.1	4.1	.1	5.9	— 2.1	
1155	Guaranteed..	16.0		5.0		6.0		
	Found.....	16.0	.0	4.8	— .2	6.1	.1	
1235	Guaranteed..	16.0		5.0		6.0		
	Found.....	16.0	.0	4.2	— .8	6.2	.2	
1153	Guaranteed..	16.3		4.3		6.5		
	Found.....	15.4	— .9	4.2	— .1	6.5	.0	
1447	Guaranteed..	15.0		4.0		8.0		
	Found.....	14.6	.4	4.0	.0	5.9	— 2.1	
1483	Guaranteed..	16.0		5.0		6.0		
	Found.....	14.7	— 1.3	4.7	— .3	5.6	— .4	
1499	Guaranteed..	15.4		4.7		5.8		
	Found.....	16.1	.7	4.9	.2	7.5	1.7	

DOG

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1227	Guaranteed..	16.0		4.0		5.0		
	Found.....	16.6	.6	4.2	.2	3.4	— 1.6	
1482	Guaranteed..	16.0		4.0		5.0		
	Found.....	14.3	— 1.7	3.0	— 1.0	1.8	— 3.2	
1128	Guaranteed..	17.0		4.0		7.0		
	Found.....	16.5	— .5	4.5	.5	6.6	— .4	
1421	Guaranteed..	17.0		4.0		7.0		
	Found.....	15.8	— 1.2	4.5	.5	5.5	— 1.5	
1422	Guaranteed..	15.5		4.0		5.0		
	Found.....	18.1	2.6	4.7	.7	2.5	2.5	
1420	Guaranteed..	15.5		4.0		5.0		
	Found.....	17.7	2.2	4.6	.6	2.4	2.6	
1426	Guaranteed..	16.5		4.0		3.0		
	Found.....	16.5	.0	4.3	.3	1.5	1.5	
1425	Guaranteed..	16.5		4.0		3.0		
	Found.....	17.0	.5	4.4	.4	1.9	1.1	

MIXED FEEDS NOT

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed weight of Package-Lbs.	Price of Package
1142	Mill Feed.....	Atlanta Milling Co., Atlanta, Ga.	Adams Grain and Prov. Co., Charlotte.	-----	75	\$ 1.53
1259	Mixed Feed	Douthal-Riddle Co., Danville, Va.	Armfield Company, Fayetteville.	Mar. 6, '17	100	1.65
1088	.....do.....	.....do.....	Garrett & McNeil, Red Springs.	Nov. 23, '16	100	1.75
1506	Cow Feed.....	Granite City Mills, Mount Airy, N. C.	West-Hill Co., Mount Airy.	June 6, '17	100	2.30
1443	Model Mill Feed.....	Model Mill Co., Johnson City, Tenn.	A. Blanton Grocery Co., Marion.	May 8, '17	75	1.95
1460	Mixed Feed.....	Moses Bros., Lexington, Va.	Parham Supply Co., Henderson.	May 23, '17	100	2.90
1084	Fine Feed or Feed Meal	Mountain City Mill Co., Chattanooga, Tenn.	-----, Red Springs.	Nov. 23, '16	100	2.25
1154	.....do.....	.....do.....	Merchants Supply Co., Burlington.	Dec. 8, '16	100	2.00
1116	.....do.....	.....do.....	Caudill Feed Co., No. Wilkesboro.	Dec. 5, '16	100	2.15
1202	.....do.....	.....do.....	Asheville Grocery Co., Asheville.	Feb. 15, '17	75	1.65
1211	.....do.....	.....do.....	J. D. Earle Feed Co., Asheville	Feb. 17, '17	75	1.65
1223	.....do.....	.....do.....	Wofford-Terrell Co., Murphy.	Feb. 19, '17	75	1.65
1226	.....do.....	.....do.....	Slayden-Fakes Co., Bryson City.	Feb. 20, '17	75	1.65
1265	.....do.....	.....do.....	Adams Grain and Prov. Co., Fayetteville.	Mar. 6, '17	75	1.90
1440	.....do.....	.....do.....	Marion Cash Feed Co., Marion.	May 7, '17	75	2.00
1488	.....do.....	.....do.....	Pearson Bros., Wilkesboro.	June 1, '17	100	2.65
1515	.....do.....	.....do.....	Carolina Warehouse Co., Greensboro.	Aug. 15, '17	100	2.50
1100	Imperial Feed.....	Newport Mill Co., London, Tenn.	Wofford, Fine & Co., Murphy.	Nov. 30, '16	75	-----
1219	.....do.....	.....do.....	Asheville Grocery Co., Asheville.	Feb. 17, '17	75	1.60
1486	.....do.....	.....do.....	Blair & Co., No. Wilkesboro.	June 1, '17	100	2.35
1091	Schumacher Feed.....	Quaker Oats Co., Chicago, Ill.	Garrett & McNeil, Red Springs.	Nov. 23, '16	100	1.80
1204	.....do.....	.....do.....	Rogers Grocery Co., Asheville.	Feb. 16, '17	100	2.10
1454	.....do.....	.....do.....	Carpenter Bros., Durham.	May 22, '17	100	2.60
1098	Spartan Grains.....	Spartan Grain and Mill Co., Spartanburg, S. C.	A. E. Rankin Co., Fayetteville.	Nov. 24, '16	100	2.25

CONTAINING MOLASSES

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1142	Guaranteed..	13.0		3.7		9.5		Wheat and corn mill feed and ground screenings not exceeding mill-run.
	Found.....	14.4	1.4	4.2	.5	7.2	2.3	
1259	Guaranteed..	10.4		4.3		10.0		Corn cob meal and wheat product.
	Found.....	9.8	.6	3.4	.9	14.0	4.0	
1088	Guaranteed..	10.4		4.3		10.0		do.
	Found.....	12.8	2.4	4.2	1	12.8	2.8	
1506	Guaranteed..							Crushed corn, bran, shorts, beet pulp, cotton-seed meal.
	Found.....	14.4		3.3		14.4		
1443	Guaranteed..	14.7		4.0		7.2		Wheat shorts, wheat bran, wheat screenings, corn and corn screenings.
	Found.....	14.2	.5	4.7	.7	6.4	.8	
1460	Guaranteed..	14.5		4.0		9.5		Wheat middlings, corn and wheat bran.
	Found.....	12.2	2.3	4.0	.0	9.1	.4	
1084	Guaranteed..	12.5		5.5		8.5		Wheat middlings, wheat shorts, ground screenings, corn bran, corn hearts, corn meal.
	Found.....	15.0	2.5	4.9	.6	7.0	1.5	
1154	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	14.7	2.2	4.3	1.2	7.1	1.4	
1116	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	14.1	1.6	4.9	.6	6.8	1.7	
1202	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	13.9	1.4	4.5	1.0	7.7	.8	
1211	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	14.7	2.2	4.6	.9	7.3	1.2	
1223	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	13.7	1.2	4.8	.7	7.0	1.5	
1226	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	14.0	1.5	4.9	.6	7.0	1.5	
1265	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	13.6	1.1	5.5	.0	7.5	1.0	
1440	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	12.7	.2	4.8	.3	6.9	1.6	
1488	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	13.7	1.2	5.0	.5	5.2	3.3	
1515	Guaranteed..	12.5		5.5		8.5		do.
	Found.....	14.6	2.1	3.8	1.7	7.7	.8	
1100	Guaranteed..	13.0		4.0		8.0		Wheat bran, wheat shorts, corn meal, corn bran, corn screenings, wheat screenings.
	Found.....	13.9	.8	4.3	.3	5.8	2.2	
1219	Guaranteed..	13.0		4.0		8.0		do.
	Found.....	13.8	.8	6.2	2.2	9.6	1.6	
1486	Guaranteed..	13.0		4.0		8.0		do.
	Found.....	13.6	.6	6.5	2.5	9.9	1.9	
1091	Guaranteed..	10.0		4.0		9.0		Ground corn, hominy feed, ground barley, wheat flour, wheat middlings, ground screenings ground puffed rice, ground puffed wheat, cotton-seed meal, oatmeal mill by-products, oat middlings, oat hulls, oat shorts, ½ per cent salt, ground Kaffir corn.
	Found.....	10.7	.7	3.0	1.0	10.5	1.5	
1204	Guaranteed..	10.0		4.0		9.0		do.
	Found.....	11.4	1.4	3.9	.1	10.9	1.9	
1454	Guaranteed..	10.0		4.0		9.0		do.
	Found.....	10.1	.1	2.7	1.3	12.2	3.2	
1098	Guaranteed..	20.0		4.0		15.0		Cotton-seed meal, corn gluten feed, dried brewer's grains, wheat shorts, wheat bran, alfalfa meal.
	Found.....	23.6	3.6	4.4	.4	13.4	1.6	

MIXED FEEDS NOT

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1139	Spartan Grains.....	Spartan Grain and Mill Co., Spartanburg, S. C.	Farmers Supply Co., Dallas	Dec. 13, '16	100	\$ 2.40
1442	do.....	do.....	Marion Cash Feed Store, Marion.	May 8, '17	100	2.75
1112	Peerless Feed.....	J. Allen Smith & Co., Knoxville, Tenn.	S. V. Thomlinson, No. Wilkesboro.	Dec. 5, '16	100	2.10
1140	do.....	do.....	F. D. Barkley & Co., Gastonia.	Dec. 13, '16	75	1.65
1233	do.....	do.....	Kirksey & Gibbs, Morgan-ton.	Feb. 22, '17	75	1.75
1440	do.....	do.....	Siler Bros., Raleigh.....	May 5, '17	100	*50.00
1491	do.....	do.....	F. D. Forrester & Co., Wilkesboro.	June 1, '17	100	2.65
1522	Mixed Feed.....	Wright Milling Co., Blue-field, W. Va.	W. H. Turner, Winston....	Sept. 21, '17	100	2.75
1459	Union Grains.....	Ubiko Milling Co., Cincinnati, O.	Upchurch Bros. & Massey, Durham.	May 22, '17	100	2.75
7481	do.....	do.....	Sent by the manufacturers	Oct. 19, '17		-----
1498	Mixed Bran.....	Southside Roller Mills, Winston-Salem, N. C.	J. E. Cox, Winston-Salem		100	2.20

*Per ton.

MIXED FEEDS CON

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1524	Big Chief Feed.....	American Feed Milling Co., Asheville, N. C.	American Feed Milling Co., Asheville.	Sept. 26, '17	100	\$ 3.45
1523	Oatfalfa Feed.....	do.....	do.....	Sept. 26, '17	100	2.50
1222	Carolina Special Horse and Mule Feed.	do.....	Wofford-Terrell Co., Mur-phy.	Feb. 2, '17	100	2.30
1495	Champion Dairy Feed.....	do.....	Southern Grocery Co., Durham.	June 5, '17	100	2.40
1134	Molasses Alfocorn Horse and Mule Feed.	Alfocorn Milling Co., East St. Louis, Ill.	Davidson & Wolff, Char-lotte.	Dec. 12, '16	100	2.30
1216	Full Pail Dairy Feed.....	do.....	J. D. Earle Feed Co., Asheville.	Feb. 17, '17	100	1.90
1458	King Cotton Horse and Mule Feed.	do.....	Rose Grocery Co., Dur-ham.	May 22, '17	100	2.85

CONTAINING MOLASSES—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1139	Guaranteed..	20.3		3.5		16.0		Cotton-seed meal, corn gluten feed, dried brewer's grains, wheat shorts, wheat bran, alfalfa meal.
	Found.....	23.6	3.6	4.0	.5	13.2	— 2.8	
1442	Guaranteed..	20.3		3.5		16.0		do.
	Found.....	21.6	1.3	4.3	.8	12.3	— 3.6	
1112	Guaranteed..	14.0		4.0		7.0		Wheat bran, wheat shorts, corn meal, corn screenings, wheat screenings.
	Found.....	13.8	— .2	5.0	1.0	6.0	— 1.0	
1140	Guaranteed..	14.0		4.0		7.0		do.
	Found.....	13.8	— .2	5.0	1.0	6.2	— .8	
1233	Guaranteed..	14.0		4.0		7.0		do.
	Found.....	14.2	.2	4.6	.6	6.1	— .9	
1450	Guaranteed..	14.0		4.0		7.0		do.
	Found.....	13.7	— .3	5.0	1.0	6.3	— .7	
1491	Guaranteed..	14.0		4.0		7.0		do.
	Found.....	14.0	.0	4.1	.1	6.7	— .3	
1522	Guaranteed..	13.2		4.0		8.4		Wheat bran, wheat middlings, red dog, rye middlings, corn bran.
	Found.....	14.9	1.7	4.3	.3	6.6	— 1.8	
1459	Guaranteed..	24.0		7.0		10.0		Fourx distillers' dried grains, choice cotton-seed meal, old process linseed meal, white wheat middlings, winter wheat bran, hominy meal, brewers' dried grains, barley malt sprouts, 0.5% fine table salt.
	Found.....	23.7	— .3	5.6	— 1.4	9.6	— .4	
7481	Guaranteed..							do.
	Found.....	25.7	1.7	7.8	.8	10.0	-----	
1498	Guaranteed..	14.5		4.0		6.5		Wheat bran, corn bran and screenings.
	Found.....	13.8	— .7	4.0	.0	8.4	1.9	

TAINING MOLASSES

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1524	Guaranteed..	10.0		3.5		7.5		
	Found.....	9.1	— .9	3.0	— .5	5.7	— 1.8	
1523	Guaranteed..	10.0		3.2		13.6		
	Found.....	12.0	2.0	3.4	.2	13.9	.3	
1222	Guaranteed..	10.1		2.1		9.0		Cracked corn, oats, alfalfa, wheat bran, salt, molasses.
	Found.....	10.6	.5	2.7	.6	11.8	2.8	
1495	Guaranteed..	24.5		5.3		8.5		Cotton-seed meal, corn meal, alfalfa meal, wheat bran, salt, molasses.
	Found.....	15.0	— 9.5	2.1	— 3.2	18.5	10.0	
1134	Guaranteed..	9.0		2.0		13.5		Alfalfa meal, whole oats (crushed), whole corn (cracked), molasses, 0.5% salt.
	Found.....	11.1	2.1	4.2	2.2	8.0	— 5.0	
1216	Guaranteed..	16.0		3.0		15.0		Cotton-seed meal, corn gluten feed, dried distillers' grains, clipped oat by-product, ground and bolted grain and flax seed screenings, alfalfa meal, molasses.
	Found.....	17.5	1.5	4.0	1.0	14.6	— .4	
1458	Guaranteed..	9.0		1.5		15.0		Corn, alfalfa meal, clipped oat by-product, molasses.
	Found.....	7.9	— 1.1	2.2	.7	10.0	— 5.0	

MIXED FEEDS CON

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1094	Sucrene Dairy Feed.....	American Milling Co., Peoria, Ill.	J. H. Culbreth Co., Fayetteville.	Nov. 24, '16	100	\$ 1.90
1215	do.....	do.....	J. D. Earle Feed Co., Asheville.	Feb. 17, '17	100	1.90
1242	do.....	American Milling Co., Peoria, Ill.	M. J. Best & Sons, Goldsboro.	Feb. 28, '17	100	2.25
1263	do.....	American Milling Co., Peoria, Ill.	J. H. Culbreth Co., Fayetteville.	Mar. 6, '17	100	2.15
1464	Colonial Horse and Mule Feed.	Colonial Cereal Co., Norfolk, Va.	Landis Grocery Co., Henderson.	May 23, '17	100	2.80
1474	do.....	do.....	Weldon Grocery Co., Weldon.	May 24, '17	100	2.75
1481a	do.....	do.....	Surry-Wilkes-Yadkin Supply Co., Elkin.	June 7, '17	100	*52.85
1481	do.....	do.....	do.....	May 3, '17	100	2.75
1469	Corno Sweet Feed.....	Corno Mills, St. Louis, Mo.	Littleton Feed and Grocery Co., Littleton.	May 23, '17	100	2.75
1097	Capital Horse and Mule Feed.	Raleigh Grain and Milling Co., Raleigh, N. C.	A. E. Rankin Co., Fayetteville.	Nov. 24, '16	100	2.00
1267	do.....	do.....	L. H. Caldwell, Lumberton.	Mar. 7, '17	100	2.50
1298	do.....	do.....	J. R. Turrentine, Wilmington.	Mar. 9, '17	100	2.00
1501	Capital Dairy Feed.....	do.....	A. I. Kaplan, Raleigh.....	June 15, '17	100	-----
1514	do.....	do.....	do.....	June 27, '17	100	-----
1248	Gem Sweet Feed.....	Edgar Morgan Co., Memphis, Tenn.	H. L. Bizzell, Goldsboro.....	Feb. 28, '17	100	2.15
1240	Nutri-Laden Horse and Mule Feed.	Farmers Cotton Oil Co., Wilson, N. C.	B. G. Thompson & Son, Goldsboro.	Feb. 28, '17	100	2.25
1414	do.....	do.....	Peacock Grocery Co., Wilson.	Mar. 14, '17	100	2.20
1429	do.....	do.....	H. C. Edwards, Goldsboro.	Mar. 28, '17	100	2.35
1241	Nutri-Laden Cattle Feed	do.....	B. G. Thompson & Son, Goldsboro.	Mar. 28, '17	100	2.25
1404	Black Mule Molasses Feed.	J. T. Gibbons, New Orleans, La.	C. L. Spencer, New Bern.....	Mar. 13, '17	100	2.00
1405	Besto Molasses Feed.....	do.....	do.....	Mar. 13, '17	100	2.25
1503	do.....	do.....	G. C. Lovill, Mount Airy.....	June 19, '17	100	2.60
1237	Hunter Horse and Mule Feed.	Grain Belt Mills Co., St. Joseph, Mo.	Elmore Maxwell Co., Greensboro.	Feb. 27, '17	100	2.30
1251	do.....	do.....	H. L. Bizzell, Goldsboro.....	Feb. 28, '17	100	2.25
1145	Mascot Horse and Mule Feed.	Golden Grain Milling Co., St. Louis, Mo.	Merchants and Farmers Supply Co., Charlotte.	Dec. 14, '16	100	2.10
1206	Ben Hur Horse and Mule Feed.	do.....	Adams Grain and Prov. Co., Asheville.	Feb. 16, '17	100	2.35

*Per ton.

TAINING MOLASSES—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1094	{ Guaranteed..... Found.....	16.5 18.0		3.5 5.7		12.0 12.8		Molasses, cotton-seed meal, corn gluten feed, ground and bolted grain screenings, clipped oat by-product, distillers' dried grains and salt.
1215	{ Guaranteed..... Found.....	16.5 21.5		3.5 6.0		12.0 12.9		do.
1242	{ Guaranteed..... Found.....	16.5 20.4		3.5 6.2		14.0 14.4		
1263	{ Guaranteed..... Found.....	16.5 20.2		3.5 5.9		14.0 10.0		
1464	{ Guaranteed..... Found.....	9.0 10.9		2.0 2.0		13.0 13.6		Crushed corn, oats, alfalfa meal, mill by-products, molasses, salt, grain screenings.
1474	{ Guaranteed..... Found.....	9.0 11.4		2.0 2.3		13.0 14.8		do.
1481a	{ Guaranteed..... Found.....	9.0 9.0		2.0 2.3		13.0 13.2		do.
1481	{ Guaranteed..... Found.....	9.0 9.4		2.0 2.0		13.0 12.0		do.
1469	{ Guaranteed..... Found.....	10.0 10.7		2.5 2.5		15.0 10.8		Whole oats (crushed), ground choice alfalfa, cracked corn, molasses.
1097	{ Guaranteed..... Found.....	10.0 8.6		2.8 1.4		12.0 11.0		Cracked corn, oats, ground grain screenings, alfalfa meal, molasses, salt.
1267	{ Guaranteed..... Found.....	10.0 8.7		2.8 1.6		12.0 11.6		do.
1298	{ Guaranteed..... Found.....	10.0 10.1		2.8 2.8		12.0 15.6		do.
1501	{ Guaranteed..... Found.....	16.0 7.2		3.0 1.2		15.0 22.7		Alfalfa meal, ground grain screenings, cotton-seed meal, molasses, salt, dried distillers' grains.
1514	{ Guaranteed..... Found.....	16.0 7.8		3.0 1.3		15.0 20.7		Alfalfa meal, ground grain screenings, cotton-seed meal, salt, dried distillers' grains.
1248	{ Guaranteed..... Found.....	20.0 21.0		4.0 3.6		15.0 13.2		Alfalfa meal, brewers' grain, wheat bran, cotton-seed meal, gluten feed, cane molasses.
1240	{ Guaranteed..... Found.....	10.0 11.2		2.5 3.0		10.0 13.9		Alfalfa, oats, corn, molasses, C. S. meal, salt.
1414	{ Guaranteed..... Found.....	10.0 12.3		2.5 2.3		10.0 15.7		do.
1429	{ Guaranteed..... Found.....	10.0 12.1		2.5 2.9		10.0 13.7		do.
1241	{ Guaranteed..... Found.....	15.0 13.4		3.0 1.6		20.0 19.0		C. S. meal, C. S. hulls, molasses, salt.
1404	{ Guaranteed..... Found.....	9.0 8.6		2.5 4.1		12.0 17.8		Corn, oats, alfalfa, rice bran, brewers' grains, oat clippings, salt, molasses.
1405	{ Guaranteed..... Found.....	10.0 9.0		3.5 2.6		12.0 14.2		Crushed oats, cracked corn, salt, alfalfa meal, molasses, bran.
1503	{ Guaranteed..... Found.....	10.0 10.1		3.5 2.3		12.0 11.9		do.
1237	{ Guaranteed..... Found.....	9.0 10.5		2.0 1.5		14.0 9.7		Corn, oats, alfalfa meal, molasses, salt.
1251	{ Guaranteed..... Found.....	9.0 10.6		2.0 1.6		14.0 9.7		do.
1145	{ Guaranteed..... Found.....	9.0 11.2		1.5 2.2		14.0 13.8		do.
1206	{ Guaranteed..... Found.....	10.0 10.7		2.0 2.4		12.0 9.1		do.

MIXED FEEDS CON

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1254	Puritan Horse and Mule Feed.	Golden Grain Milling Co., St. Louis, Mo.	Adams Grain and Prov. Co., Fayetteville.	Mar. 6, '17	100	\$ 2.25
1299	Golden Grain Horse and Mule Feed.	do.....	Worth & Co., Wilmington.	Mar. 9, '17	100	2.40
1207	International Jewel Dairy Feed.	International Sugar Feed No. 2 Co., Memphis.	Adams Grain and Prov. Co., Asheville.	Feb. 16, '17	100	1.90
1512	do.....	do.....	Wayne Distributing Co., Goldsboro.	June 26, '17	100	*37.00
1513	do.....	do.....	do.....	June 26, '17		
1526	Dan Patch Horse Feed.	do.....	Asheville Grocery Co., Asheville.	Sept. 26, '17	100	*51.00
1527	Arrow Horse Feed.....	do.....	do.....	Sept. 26, '17	100	*46.00
1286	Peck's Mule Feed with Molasses.	Illinois Feed Mills, St. Louis, Mo.	McNair & Pearsall, Wil- mington.	Mar. 9, '17	100	2.35
1480	Little Jo Horse Feed.....	Just Mills, Nashville, Tenn.	W. J. Snow, Elkin.....	Mar. 31, '17	100	2.90
1456	Bully Mule Feed.....	do.....	E. H. & L. V. Lawrence, Durham.	May 22, '17	100	2.60
1507	do.....	do.....	Mount Airy Feed Store, Mount Airy.	June 19, '17	100	2.50
1225	Crescent Molasses Feed..	George B. Matthews & Sons, New Orleans, La.	Slayden-Fakes Co., Bryn- son City.	Feb. 20, '17	100	2.25
1201	Jockey Horse and Mule Feed.	Marco Mills, Pine Bluff, Ark.	Asheville Grocery Co., Asheville.	Feb. 15, '17	100	2.10
1200	Mareo Feed.....	do.....	do.....	Feb. 15, '17	100	2.25
1276	Diamond "C" Feed.....	National Oats Co., St. Louis, Mo.	J. W. Brooks, Wilmington.	Mar. 8, '17	100	2.25
1180	Nutro Sweet Feed.....	do.....	H. W. Little & Co., Wades- boro.	Jan. 31, '17	100	2.25
1470	Pawnee Sweet Feed.....	do.....	Littleton Feed and Gro- cery Co., Littleton.	May 23, '17	100	2.65
1496	do.....	do.....	Southern Grocery Co., Durham.	June 5, '17	100	3.00
1408	Best Yet Molasses Feed..	National Milling Co., Macon, Ga.	T. P. Ashford, New Bern.	Mar. 13, '17	100	2.00
1471	Cornless Horse and Mule Feed.	Norfolk Alfalfa Feed Mill- ing Co., Norfolk, Va.	S. J. Stallings, Littleton.	May 23, '17	100	2.75
1477	do.....	do.....	Weldon Grocery Co., Wel- don.	May 24, '17	100	2.75
1437	Millbank Dairy Feed.....	Norfolk Feed Milling Co., Norfolk, Va.	Sanford Grocery and Pro- vision Co., Sanford.	May 3, '17	100	2.75
1255	do.....	do.....	Adams Grain and Prov. Co., Fayetteville.	Mar. 6, '17	100	1.90
1438	Diamond Horse and Mule Feed.	do.....	Sanford Grain and Prov. Co., Sanford.	May 3, '17	100	2.75

*Per ton.

TAINING MOLASSES—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1234	Guaranteed.....	9.0		1.5		14.0		Corn, oats, alfalfa meal, molasses, salt,
	Found.....	12.3	3.3	2.1	.6	20.5	6.5	
1299	Guaranteed.....	9.0		2.0		14.0		do.
	Found.....	10.7	1.7	2.4	.4	10.8	4.2	
1207	Guaranteed.....	9.0		2.0		12.5		Cracked corn, alfalfa meal, clipped oats by-product, molasses, cotton-seed meal, salt.
	Found.....	9.0	.0	1.4	.6	15.2	2.7	
1512	Guaranteed.....	9.0		2.0		12.5		do.
	Found.....	8.8	.2	1.6	.4	18.1	5.6	
1513	Guaranteed.....	9.0		2.0		12.5		do.
	Found.....	8.8	.2	1.6	.4	17.8	5.3	
1526	Guaranteed.....	9.0		2.3		12.5		
	Found.....	12.5	3.5	2.9	.6	10.3	2.2	
1527	Guaranteed.....	9.0		1.0		15.0		
	Found.....	10.5	1.5	1.8	.8	16.0	1.0	
1286	Guaranteed.....	9.0		1.5		15.0		Cracked corn, oats, ground alfalfa, molasses, salt.
	Found.....	10.3	1.3	1.9	.4	16.1	1.1	
1480	Guaranteed.....	9.0		1.5		17.0		do.
	Found.....	11.5	2.5	1.9	.4	17.8	.8	
1456	Guaranteed.....	10.0		3.0		20.0		Cracked corn, oats, alfalfa meal, brewers' dried grains, palmo meal (peanut meats, palm oil, peanut hulls), molasses, salt.
	Found.....	9.6	.4	4.3	1.3	22.7	2.7	
1507	Guaranteed.....	10.0		3.0		20.0		do.
	Found.....	9.3	.7	3.6	.6	23.1	3.1	
1225	Guaranteed.....	11.0		3.5		12.0		Corn, oats, alfalfa meal, cotton-seed meal, rice bran, grain screenings, molasses, salt.
	Found.....	10.5	.5	4.7	1.2	15.4	3.4	
1201	Guaranteed.....	9.8		2.5		15.0		Corn, oats, alfalfa, ground hay, molasses.
	Found.....	6.9	2.9	1.9	.6	15.6	.6	
1200	Guaranteed.....	10.5		3.0		10.0		Cracked corn, oats, alfalfa meal, molasses.
	Found.....	9.9	.6	2.7	.3	13.8	3.8	
1276	Guaranteed.....	9.0		2.5		15.0		Ground alfalfa, cracked corn, oat feed, molasses, ground grain screenings.
	Found.....	9.1	.1	2.3	.2	13.5	1.5	
1180	Guaranteed.....	9.0		2.5		15.0		do.
	Found.....	8.5	.5	2.2	.3	15.1	.1	
1470	Guaranteed.....	10.0		2.0		19.0		do.
	Found.....	9.1	.9	1.9	.1	15.8	3.2	
1496	Guaranteed.....	10.0		2.0		19.0		do.
	Found.....	9.4	.6	2.1	.1	14.4	4.6	
1408	Guaranteed.....	9.0		1.5		16.0		Ground corn, oats, alfalfa hay, cane molasses.
	Found.....	10.1	1.1	1.6	.1	19.2	3.2	
1471	Guaranteed.....	11.0		3.0		13.0		Ground velvet beans and hulls, alfalfa meal, oatmeal mill by-product (oat middlings, oat shorts, oat hulls), molasses, salt, ground grain screenings.
	Found.....	10.6	.4	3.4	.4	18.0	5.0	
1477	Guaranteed.....	11.0		3.0		13.0		do.
	Found.....	9.5	1.5	1.6	1.4	21.0	8.0	
1437	Guaranteed.....	12.5		3.0		20.0		Cotton-seed meal, corn meal, alfalfa meal, oatmeal mill by-product (oat middlings, oat shorts, and oat hulls), ground grain screenings, molasses, salt.
	Found.....	9.8	2.7	1.0	2.0	12.6	7.4	
1255	Guaranteed.....	12.5		3.0		20.0		do.
	Found.....	11.1	1.4	2.2	.8	19.4	.6	
1438	Guaranteed.....	10.0		2.5		13.0		Cracked corn, rolled oats, alfalfa meal, molasses, cotton-seed meal, oatmeal mill by-product (oat middlings, oat shorts, oat hulls), salt.
	Found.....	7.6	2.4	1.0	1.5	13.7	.7	

MIXED FEEDS CON

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed weight of Package—Lbs.	Price of Package
1467	Westover Horse and Mule Feed.	Norfolk Feed Milling Co., Norfolk, Va.	Vance Grocery Co., Henderson.	May 23, '17	100	\$ 2.80
1289	Nutriline Stock Feed	Nutriline Milling Co., Ltd., Crowley, La.	McNair & Pearsall, Wilmington.	Mar. 9, '17	100	2.15
1086	do	do	Red Springs Trading Co., Red Springs.	Nov. 23, '16	100	2.25
1087	Momylk Dairy Feed	do	do	Nov. 23, '16	100	2.25
1290	do	do	McNair & Pearsall, Wilmington.	Mar. 9, '17	100	2.15
1282	Perfection Horse Feed	Omaha Alfalfa Milling Co., Omaha, Neb.	B. F. Mitchell, Wilmington.	Mar. 9, '17	100	2.40
1295	Southern Mule Feed	Purina Mills, St. Louis, Mo.	S. P. McNair, Wilmington.	Mar. 9, '17	100	2.15
1279	Arab Horse Feed	M. C. Peters Mill Co., Omaha, Neb.	D. L. Gore Co., Wilmington	Mar. 9, '17	100	2.10
1217	Re-Peter Horse Feed	do	J. D. Earle Feed Co., Asheville.	Feb. 17, '17	100	2.25
1213	Rabbit Mule Feed	do	do	Feb. 17, '17	100	2.10
1505	Big Mule Molasses Feed	Quaker Oats Co., Chicago, Ill.	The West-Hill Co., Mount Airy.	June 19, '17	100	2.60
1274	Mascot Feed	Southern Feed Co., Inc., Newport News, Va.	J. T. Ginn Grocery Co., Goldsboro.	June 28, '17	100	2.20
1260	do	do	The Armfield Co., Fayetteville.	Mar. 6, '17	100	2.00
1417	Full Pail Dairy Feed	do	Wells Grocery Co., Wilson.	Mar. 14, '17	100	2.00
1493	Supreme Horse and Mule Feed.	Virginia Feed Milling Co., Alexandria, Va.	Southern Grocery Co., Durham.	June 5, '17	100	2.75

COTTON-SEED FEED AND

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price of Package
1300	Cotton Seed Feed	American Feed Milling Co., Asheville.	Slayden-Fakes Co., Bryson City.	Feb. 20, '17	100	\$ 2.20
1179	do	do	W. H. McClure, Hazelwood	Jan. 17, '17	100	*42.00
1198	do	Atlanta Cotton Oil Co., Atlanta, Ga.	Wofford-Terrell Co., Murphy.	Feb. 19, '17	100	2.15
1194	Jay Brand Cotton Seed Feed.	F. W. Brod& Co., Memphis, Tenn.	Asheville Grocery Co., Asheville.	Feb. 15, '17	100	2.15
1159	Buckeye Standard Cotton Seed Feed.	Buckeye Cotton Oil Co., Cincinnati, O. (Charlotte, N. C., Mill).	Peeler Company, Salisbury	Dec. 15, '16	100	2.30

*Per ton.

TAINING MOLASSES—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1467	Guaranteed..	10.0		2.5		13.0		Cracked corn, rolled oats, alfalfa meal, molasses, salt.
	Found.....	8.2	— 1.8	1.1	1.5	9.3	— 3.7	
1289	Guaranteed..	9.0		3.0		12.0		Corn, Kaffir corn, alfalfa, cotton-seed meal, rice bran, molasses, salt.
	Found.....	11.7	2.7	6.9	3.9	13.8	1.8	
1086	Guaranteed..	9.0		3.0		12.0		do.
	Found.....	12.6	3.6	8.1	5.1	11.3	.7	
1087	Guaranteed..	14.0		3.5		12.0		Cotton-seed meal, rice bran, rice polish, corn, alfalfa, molasses, salt
	Found.....	14.6	0.6	7.4	3.9	16.1	4.1	
1290	Guaranteed..	12.0		3.0		12.0		Cotton-seed meal, rice bran, alfalfa, molasses.
	Found.....	14.9	2.9	9.4	6.4	14.5	2.5	
1282	Guaranteed..	10.0		2.0		12.0		Corn, oats, alfalfa meal, molasses.
	Found.....	11.3	1.3	2.5	.5	12.4	.4	
1295	Guaranteed..	9.0		2.5		17.0		Cracked corn, oats, molasses, clipped oat by-product, palmo meal, dried brewers' grains, salt.
	Found.....	9.7	.7	4.1	1.6	22.5	5.5	
1297	Guaranteed..	10.0		2.0		15.0		Cracked corn, whole oats, alfalfa meal, molasses.
	Found.....	11.4	1.4	2.3	.3	11.2	— 3.8	
1217	Guaranteed..	10.0		1.5		18.0		Corn, oats, alfalfa, molasses.
	Found.....	10.4	.4	2.3	.8	13.5	— 4.5	
1213	Guaranteed..	9.0		1.5		18.0		do.
	Found.....	12.5	3.5	1.7	.2	16.6	— 1.4	
1505	Guaranteed..	10.0		2.5		15.0		Alfalfa, corn, molasses, peanut skins and hulls.
	Found.....	11.4	1.4	2.7	.2	14.4	— .6	
1247	Guaranteed..	10.0		4.0		15.0		do.
	Found.....	11.0	1.0	4.3	— .3	18.5	3.5	
1260	Guaranteed..	10.0		4.0		15.0		Cotton-seed meal, wheat bran, oat by-product, corn meal, molasses.
	Found.....	10.4	.4	4.7	.7	15.6	.6	
1417	Guaranteed..	12.5		2.5		15.0		Cracked corn, rolled oats, alfalfa meal, malt sprouts, molasses, salt.
	Found.....	14.8	2.3	1.9	— .6	14.7	— .3	
1493	Guaranteed..	12.0		3.0		10.0		
	Found.....	11.0	— 1.0	2.0	— 1.0	13.0	3.0	

COTTON-SEED MEAL

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1300	Guaranteed..	36.0		6.0		10.0		Cotton-seed meal and cotton-seed hulls.
	Found.....	37.0	1.0	5.0	— 1.0	12.0	— 2.0	
1179	Guaranteed..	36.0		5.0		12.0		do.
	Found.....	35.4	— .6	6.9	1.9	10.5	1.5	
1198	Guaranteed..	36.0		5.0		12.0		do.
	Found.....	33.3	— 2.7	6.1	1.1	13.4	1.4	
1194	Guaranteed..	36.0		5.0		14.0		do.
	Found.....	34.2	— 1.8	5.8	.8	14.4	.4	
1159	Guaranteed..	36.0		6.5		12.0		do.
	Found.....	33.0	— 3.0	5.7	— .8	13.5	1.5	

COTTON-SEED FEED AND

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1181	Buckeye Standard Cotton Seed Meal.	Buckeye Cotton Oil Co., Cincinnati, O. (Charlotte, N. C. Mill.	H. W. Little, Wadesboro...	Jan. 31, '17	100	\$ 2.25
1123	do.....	do.....	Farmers Supply Co., Dallas	Dec. 13, '16	100	2.35
1120	do.....	do.....	Davidson & Wolff, Charlotte.	Dec. 12, '16	100	2.15
1308	Good Cotton Seed Feed	Eastern Cotton Oil Co., Hertford, N. C.	Hancock & Co., Beaufort	Dec. 20, '16	-----	-----
1304	Cotton Seed Meal	Elba Mfg. Co., Charlotte, N. C.	Elmore Maxwell Co., Greensboro.	Feb. 27, '17	100	2.30
1158	do.....	do.....	J. P. Green, Mocksville...	Dec. 7, '16	100	1.85
1196	Cotton Seed Feed.....	Home Oil Mill, Decatur, Ala.	J. D. Earle Feed Co., Asheville.	Feb. 17, '17	100	2.10
1178	do.....	do.....	W. H. McClure, Hazelwood.	Jan. 17, '17	100	*42.00
1489	do.....	H. N. Johnson, Athens, Ga.	Pearson Bros., Wilkesboro.	June 1, '17	100	3.25
1301	Kershaw Cotton Seed Feed.	Kershaw Oil Mill, Kershaw, S. C.	Shuping & Poteat, Morganton.	Feb. 2, '17	100	2.40
1161	Kershaw Cotton Seed Meal.	do.....	Overman & Co., Salisbury	Dec. 15, '16	100	2.30
1339	Leoc Fertilizer Brand Cotton Seed Feed.	Lenoir Oil and Ice Co., Kinston, N. C.	Davison Bros, Kinston....	Mar. 28, '17	100	2.25
1321	do.....	do.....	J. P. Waters, LaGrange....	Mar. 21, '17	-----	*40.25
1403	Fertilizer Brand Cotton Seed Feed.	New Bern Cotton Oil and Fert. Mills, New Bern, N. C.	C. L. Spencer, New Bern...	Mar. 13, '17	100	2.30
1105	Standard Grade Cotton Seed Meal.	Newton County Oil Mills, Covington, Ga.	Diekey Feed Co., Murphy.	Dec. 1, '16	-----	-----
1520	Golden Rod Bran Cotton Seed Feed.	Poe Cotton Products Co., Memphis, Tenn.	American Feed Milling Co., Asheville.	-----	100	*48.25
1330	Fertilizer Brand Cotton Seed Meal.	Raleigh Cotton Oil Co., Raleigh, N. C.	Lyon-Winston Co., Oxford.	Mar. 23, '17	100	2.40
1503	Star Fertilizer Brand Cotton Seed Feed.	do.....	W. A. Myatt, Raleigh....	-----	-----	-----
1185	do.....	do.....	do.....	May 19, '17	-----	-----
1184	do.....	do.....	do.....	May 19, '17	-----	-----
1309	Cotton Seed Feed.....	Robeson Mfg. Co., Lumberton, N. C.	R. C. Oliver, Marietta....	Feb. 21, '17	-----	-----
1311	do.....	do.....	M. A. Canady, Hope Mills.	Feb. 28, '17	-----	-----
1312	do.....	do.....	Jesse Horner, Hope Mills.	Feb. 28, '17	-----	-----
1193	do.....	do.....	D. S. Hall, Fayetteville, R. S.	Feb. 13, '17	-----	-----
1163	do.....	Scott Brokerage and Com. Co., Charlotte, N. C.	City Feed Co., Hickory....	-----	-----	-----
1174	do.....	do.....	Shuping & Poteat, Morganton.	Dec. 20, '16	100	2.20

COTTON-SEED MEAL—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1181	{ Guaranteed.. Found.....	36.0 33.3	— 2.7	6.5 5.7	— .8	12.0 13.3	1.3	Cotton-seed meal and cotton-seed hulls.
1123	{ Guaranteed.. Found.....	36.0 34.7	— 1.3	6.5 6.1	— .4	12.0 12.1	.1	do.
1120	{ Guaranteed.. Found.....	36.0 37.5	1.5	6.5 6.4	— .1	12.0 10.3	— 1.7	do.
1308	{ Guaranteed.. Found.....	36.0 34.0	— 2.0	5.0	—	12.0	—	do.
1304	{ Guaranteed.. Found.....	38.6 37.8	— .8	6.0	—	10.0	—	do.
1158	{ Guaranteed.. Found.....	38.6 40.0	1.4	7.4	—	9.0	—	do.
1196	{ Guaranteed.. Found.....	36.0 37.5	1.5	8.0	—	12.0 10.5	1.5	do.
1178	{ Guaranteed.. Found.....	36.0 34.0	— 2.0	7.4	—	12.0 11.9	— .1	do.
1489	{ Guaranteed.. Found.....	36.0 33.7	— 2.3	5.5 5.5	.0	15.0 12.0	— 3.0	do.
1301	{ Guaranteed.. Found.....	36.0 37.3	1.3	5.0	—	12.0	—	do.
1161	{ Guaranteed.. Found.....	38.6 36.9	— 1.7	—	—	—	—	do.
1339	{ Guaranteed.. Found.....	31.5 30.0	— 1.5	6.5	—	14.0	—	Cotton-seed meal and cotton-seed hulls.
1321	{ Guaranteed.. Found.....	31.5 33.2	1.7	6.5	—	14.1	—	do.
1403	{ Guaranteed.. Found.....	36.0 34.4	— 1.6	5.0 6.4	1.4	12.5 11.9	— .6	do.
1105	{ Guaranteed.. Found.....	38.6 32.1	— 6.5	5.6	—	13.1	—	do.
1520	{ Guaranteed.. Found.....	36.0 35.1	— .9	5.0 5.8	.8	14.0 11.2	2.8	Cotton-seed meal and cotton-seed hulls.
1330	{ Guaranteed.. Found.....	36.0 34.5	— 1.5	—	—	—	—	do.
1303	{ Guaranteed.. Found.....	36.0 33.3	— 2.7	—	—	—	—	do.
1183	{ Guaranteed.. Found.....	36.0 32.5	— 3.5	5.0 6.3	1.3	12.5 14.0	1.5	do.
1184	{ Guaranteed.. Found.....	36.0 35.0	— 1.0	5.0 6.4	1.4	12.5 11.7	— .8	do.
1309	{ Guaranteed.. Found.....	36.0 32.2	— 3.8	5.0	—	12.0	—	do.
1311	{ Guaranteed.. Found.....	36.0 34.0	— 2.0	5.0	—	12.0	—	do.
1312	{ Guaranteed.. Found.....	36.0 33.2	— 2.8	5.0	—	12.0	—	do.
1193	{ Guaranteed.. Found.....	36.0 34.0	2.0	5.0 6.7	1.7	12.0 13.5	1.5	do.
1163	{ Guaranteed.. Found.....	36.0 30.4	— 5.6	6.5 5.3	— 1.2	12.0 14.6	2.6	do.
1174	{ Guaranteed.. Found.....	36.0 35.1	— .9	6.5 6.1	— .4	12.0 12.7	.7	do.

COTTON-SEED FEED AND

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package—Lbs.	Price of Package
1175	Cotton Seed Feed.....	Scott Brokerage and Com. Co., Charlotte, N. C.	W. H. McClure, Hazelwood.	Feb. 27, '17	100	*40.00
1074	do.....	do.....	Hyatt & Co., Waynesville	Oct. 23, '16	100	-----
1079	do.....	do.....	Iredell Farmers' Union Whse. Co., Statesville.	Nov. 17, '16	100	2.20
1122	do.....	Southern Cotton Oil Co., Charlotte, N. C.	Farmers Supply Co., Dallas.	Dec. 13, '16	100	2.25
1169	Seven Per Cent Cotton Seed Feed.	do.....	J. O. Plott, Canton.....	Dec. 19, '16	100	*41.00
1160	Seoco Cotton Seed Feed..	do.....	Overman Company, Salisbury.	Dec. 15, '16	100	2.30
1188	do.....	do.....	J. P. Shaw, Laurinburg, R. 2.	Jan. 1, '17	-----	-----
1083	do.....	Southern Cotton Oil Co., Fayetteville, N. C.	A. E. Rankin Co., Fayetteville.	Nov. 24, '16	100	2.25
1186	do.....	do.....	R. B. Evans, Fayetteville	Jan. 27, '17	-----	-----
1188	do.....	do.....	W. H. Marsh, Alderman...	Feb. 13, '17	100	-----
1189	do.....	do.....	D. S. Hall, Fayetteville, R. 8.	Feb. 13, '17	100	-----
1190	do.....	do.....	F. A. Marsh, Fayetteville, R. 8.	Feb. 13, '17	100	-----
1191	do.....	do.....	Marsh & Purdis, Fayetteville.	Feb. 13, '17	100	-----
1310	do.....	do.....	Jasper Waters, St. Paul, R. 4.	Feb. 22, '17	100	-----
1313	do.....	do.....	J. W. Cashwell, Hope Mills, R. 2.	Feb. 28, '17	100	-----
1307	do.....	Southern Cotton Oil Co., Goldsboro, N. C.	M. J. Best & Sons, Goldsboro.	Feb. 28, '17	100	2.20
1306	do.....	do.....	B. G. Thompson, Goldsboro.	Feb. 28, '17	100	2.20
1316	do.....	Southern Cotton Oil Co., Wilson, N. C.	Wells Grocery Co., Wilson	Mar. 14, '17	100	2.50
1173	Cotton Seed Feed.....	Swift & Co. Oil Mill, Columbia, S. C.	Shuping & Poteat, Morganton.	Dec. 20, '16	100	2.20
1195	do.....	do.....	Adams Grain and Prov. Co., Asheville.	Feb. 16, '17	100	2.10
1103	do.....	Taylor Commission Co., Atlanta, Ga.	Savage & Bros., Murphy	Dec. 1, '16	100	-----
1168	do.....	do.....	Smathers Grocery Co., Canton.	Dec. 19, '16	100	*38.00
1176	do.....	do.....	do.....	Dec. 26, '16	100	*41.80
1199	do.....	do.....	Savage & Bros., Murphy	Feb. 19, '17	100	2.25
1305	do.....	do.....	Elmore Maxwell Co., Greensboro.	Feb. 27, '17	100	2.20
1185	do.....	Tar River Oil Co., Tarboro, N. C.	Bragaw & Co., Washington.	Jan. 27, '17	100	-----
1129	Number 7 Cotton Seed Feed.	Union Seed and Fertilizer Co., Raleigh, N. C.	Cochran & McGlauchlin Co., Charlotte.	Dec. 12, '16	100	2.15

*Per ton.

COTTON-SEED MEAL—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1175	Guaranteed..	36.0		6.5		12.0		Cotton-seed meal and cotton-seed hulls.
	Found.....	33.8	— 2.2	5.9	— .6	12.9	.9	
1074	Guaranteed..	36.0		6.5		12.0		do.
	Found.....	33.4	— 2.6	6.2	— .3	13.7	1.7	
1079	Guaranteed..	36.0		6.5		12.0		do.
	Found.....	32.4	— 3.6	6.2	— .3	14.0	2.0	
1122	Guaranteed..	33.0		5.5		16.0		do.
	Found.....	31.4	— 1.6	6.3	.8	14.0	— 6.0	
1169	Guaranteed..	36.0		6.0		15.0		do.
	Found.....	35.3	— .7	6.5	.5	10.7	— 4.3	
1160	Guaranteed..	36.0		6.0		12.0		do.
	Found.....	33.0	— 3.0	6.5	.5	12.9	.9	
1187	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	35.2	— .8	6.5	1.5	11.9	— .6	
1083	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	34.6	— 1.4	7.4	2.4	10.8	— 1.7	
1186	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	33.0	— 3.0	6.9	1.9	12.5	.0	
1188	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	34.7	— 1.3	6.9	1.9	11.3	— 1.2	
1189	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	36.5	.5	7.7	2.7	10.0	— 2.5	
1190	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	34.7	— 1.3	6.6	1.6	11.3	— 1.2	
1191	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	33.5	— 2.5	6.7	1.7	11.8	— .7	
1310	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	33.3	— 2.7					
1313	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	32.7	— 3.3					
1307	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	35.3	— .7					
1306	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	34.3	— .7					
1316	Guaranteed..	36.0		5.0		12.5		do.
	Found.....	32.7	— 3.3					
1173	Guaranteed..	36.0		5.0		12.0		do.
	Found.....	37.3	1.3	7.0	2.0	14.1	2.1	
1195	Guaranteed..	36.0		5.0		12.0		do.
	Found.....	35.3	— .7	5.5	.5	12.9	.9	
1103	Guaranteed..	36.0		5.5		14.0		do.
	Found.....	35.0	— 1.0	6.7	1.2	11.0	— 3.0	
1168	Guaranteed..	36.0		5.5		14.0		do.
	Found.....	33.4	— 2.6	7.2	1.7	13.3	.7	
1176	Guaranteed..	36.0		5.5		14.0		do.
	Found.....	37.3	1.3	7.1	1.6	14.1	.1	
1199	Guaranteed..	36.0		5.5		14.0		do.
	Found.....	37.4	1.4	6.7	1.2	10.9	3.1	
1305	Guaranteed..	36.0		5.5		14.0		do.
	Found.....	34.1	— 1.9					
1185	Guaranteed..	36.0		5.0		13.0		do.
	Found.....	35.6	— .4	7.2	2.2	12.2	— .8	
1129	Guaranteed..	36.0		5.5		14.0		do.
	Found.....	32.5	— 3.5	6.6	1.1	13.0	1.0	

COTTON-SEED FEED AND

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1130	Number 7 Cotton Seed Feed.	Union Seed and Fertilizer Co., Raleigh, N. C.	Charles Moody Co., Charlotte.	Dec. 12, '16	100	\$ 2.20
1192	do	Union Seed and Fertilizer Co., Wilmington, N. C.	H. L. Tolar, Fayetteville, R. 8.	Feb. 13, '17	100	-----
1302	do	do	J. J. Page, Marietta	Feb. 21, '17	100	-----
1314	do	do	D. L. Gore, Wilmington	Mar. 9, '17	100	2.25
1264	Buco Cotton Seed Feed	Buckeye Cotton Oil Co., Cincinnati, O.	Adams Grain and Prov. Co., Fayetteville.	Mar. 6, '17	100	1.75
1402	do	do	Center Mercantile Co., So. Winston-Salem.	Mar. 6, '17	100	-----
1497	do	do	Southside Roller Mills, Winston-Salem.	-----	100	*28.00
1075	do	do	Wofford-Fain Co., Murphy.	Oct. 25, '16	100	-----
1082	do	do	Garrett & McNeal, Red Springs.	Nov. 23, '16	100	1.90
1102	do	do	Wofford-Fain Co., Murphy.	Dec. 1, '16	100	-----
1108	do	do	Pearson Bros., No. Wilkesboro.	Dec. 5, '16	100	2.00
1109	do	do	Angelo Bros., Winston-Salem.	Dec. 6, '16	100	1.75
1148	do	do	Harris & McNeely Co., Mooresville.	Dec. 7, '16	100	2.10
1149	do	do	J. P. Green, Mocksville	Dec. 7, '16	100	1.75
1150	do	do	W. H. Turner, Winston-Salem.	Dec. 7, '16	100	1.75
1151	do	do	Lapscott & Trollinger, Burlington.	Dec. 8, '16	100	1.75
1121	do	do	Charles Moody Co., Charlotte.	Dec. 12, '16	100	2.10
1125	do	do	R. Hope Bryson Co., Gastonia.	Dec. 13, '16	100	1.70
1124	do	do	Farmers Supply Co., Dallas.	Dec. 13, '16	100	1.90
1127	do	do	Adams Grain and Prov. Co., Charlotte.	Dec. 14, '16	100	1.60
1081	Creamo Brand Cotton Seed Feed.	Tennessee Fiber Co., Memphis, Tenn.	Thrower Co., Red Springs	Nov. 23, '16	100	2.00
1152	do	do	Merchants Supply Co., Burlington.	Dec. 8, '16	100	1.90
1249	do	do	H. L. Bizzell, Goldsboro	Feb. 28, '17	100	1.75
1268	do	do	L. H. Caldwell, Lumberton.	Mar. 7, '17	100	2.25
1277	do	do	J. W. Brooks, Wilmington	Mar. 8, '17	100	1.85
1280	do	do	D. L. Gore Co., Wilmington	Mar. 9, '17	100	1.80
1287	do	do	McNair & Pearsall, Wilmington.	Mar. 9, '17	100	1.75

*Per ton.

COTTON-SEED MEAL—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1130	Guaranteed..	36.0		5.5		14.0		Cotton-seed meal and cotton-seed hulls.
	Found.....	35.9	— .1	6.9	1.4	12.1	— 1.9	
1192	Guaranteed..	36.0		5.5		14.0		do.
	Found.....	34.2	— 1.8	6.2	.7	12.8	— 1.2	
1302	Guaranteed..	36.0		5.5		14.0		do.
	Found.....	36.1	.1					
1314	Guaranteed..	36.0		5.5		14.0		do.
	Found.....	34.5	— 1.5					
1264	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	19.2	— .8	3.5	.0	23.4	— 3.6	
1402	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	20.3	.3	3.4	— .1	22.5	— 4.5	
1497	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	22.1	2.1	3.5	.0	21.9	— 5.1	
1075	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	16.9	— 3.1	3.0	— .5	25.5	— 1.5	
1082	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	13.1	— 6.9	2.6	— .9	28.0	1.0	
1102	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	23.4	3.4	4.3	.8	20.2	— 6.8	
1108	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	20.5	.5	3.6	.1	23.4	— 3.6	
1109	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	19.7	— .3	3.4	— .1	23.5	— 3.5	
1148	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	22.3	2.3	3.9	.4	27.1	.1	
1149	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	17.4	— 2.6	3.0	— .5	25.9	— 1.1	
1150	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	20.8	.8	3.8	.3	22.5	— 4.5	
1151	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	17.7	— 2.3	3.1	— .4	26.8	— .2	
1121	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	21.9	1.9	3.5	.0	22.4	— 4.6	
1125	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	18.3	— 1.7	3.4	— .1	24.4	— 2.6	
1124	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	21.6	1.6	3.9	.4	22.2	— 4.6	
1127	Guaranteed..	20.0		3.5		27.0		do.
	Found.....	19.7	— .3	3.6	— .1	24.4	— 2.6	
1081	Guaranteed..	20.0		4.0		22.0		do.
	Found.....	21.1	1.1	3.5	— .5	22.5	.5	
1152	Guaranteed..	20.0		4.0		25.0		do.
	Found.....	18.3	— 1.7	3.3	— .7	26.0	1.0	
1249	Guaranteed..	20.0		5.0		22.0		do.
	Found.....	19.9	— .1	4.0	— 1.0	23.5	1.5	
1268	Guaranteed..	20.0		5.0		22.0		do.
	Found.....	21.4	1.4	3.1	— 1.9	22.8	.8	
1277	Guaranteed..	20.0		4.0		25.0		do.
	Found.....	18.8	— 1.1	3.7	— .3	23.6	1.4	
1280	Guaranteed..	20.0		4.0		25.0		do.
	Found.....	19.1	— .9	3.8	— .2	23.3	— 1.7	
1287	Guaranteed..	20.0		5.0		22.0		do.
	Found.....	19.1	— .9	3.7	— 1.3	24.1	2.1	

COTTON-SEED FEED AND

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed weight of Package-Lbs.	Price of Package
1409	Cremo Brand Cotton Seed Feed.	Tennessee Fiber Co., Memphis, Tenn.	Armstrong Grocery Co., New Bern.	Mar. 13, '17	100	1.80
1104	Cyclone Cotton Seed Feed	Memphis Cotton Hull and Fiber Co., Memphis, Tenn.	Savage & Bros., Murphy	Dec. 1, '16	100	-----
1107	do	do	S. V. Thomlinson, No. Wilkesboro.	Dec. 5, '16	100	1.90
1170	do	do	J. O. Plott, Canton	Dec. 12, '16	100	*32.00
1203	do	do	Asheville Grocery Co., Asheville.	Feb. 15, '17	100	1.75
1197	do	do	J. D. Earle Feed Co., Asheville.	Feb. 17, '17	100	1.75
1275	do	do	J. W. Brooks, Wilmington.	Mar. 8, '17	100	1.85
1283	do	do	B. F. Mitchell Co., Wilmington.	Mar. 9, '17	100	1.85
1411	Carolina Cotton Seed Feed	Farmers Cotton Oil Co., Wilson, N. C.	Peacock Grocery Co., Wilson.	Mar. 14, '17	100	1.75
1162	Ker-Mil Dairy Feed	Kershaw Oil Mill, Kershaw, S. C.	Overman Company, Salisbury.	Dec. 15, '16	100	1.40

*Per ton.

VELVET BEAN FEED, PEANUT

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1269	Velvet Bean Feed	Butler County Feed and Milling Co., Greenville, Ala.	J. H. Wishart, Lumberton.	Mar. 7, '17	100	\$ 2.00
1465	do	Dan Joseph Co., Columbus, Ga.	Landis Grocery Co., Henderson.	May 23, '17	100	1.90
1218	do	C. G. Hewitt, Montgomery, Ala.	American Feed Milling Co., Asheville.	Feb. 17, '17	100	1.65
1256	do	do	Adams Grain and Prov. Co., Fayetteville.	Mar. 6, '17	100	1.85
1266	do	do	L. H. Caldwell, Lumberton.	Mar. 7, '17	100	2.25
1291	Supreme Velvet Bean Feed.	do	McNair & Pearsall, Wilmington.	Mar. 9, '17	100	1.80
1214	Velvet Bean Feed	McGowin-Bennett Milling Co., Georgiana, Ala.	J. D. Earle Feed Co., Asheville.	Feb. 17, '17	100	1.70
1262	do	Peoples Cotton Oil Co., Selma, Ala.	Armfield Co., Fayetteville.	Mar. 6, '17	100	1.80
1272	do	do	Pearsall & Co., Wilmington.	Mar. 8, '17	100	1.80
1294	do	do	S. P. McNair, Wilmington.	Mar. 9, '17	100	1.80

COTTON-SEED MEAL—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1409	Guaranteed..	20.0		4.0		25.0		Cotton-seed meal and cotton-seed hulls.
	Found.....	19.0	— 1.0	3.6	— .4	23.2	— 1.8	
1104	Guaranteed..	20.0		3.0		23.0		do.
	Found.....	19.1	— .9	3.5	.5	24.0	1.0	
1107	Guaranteed..	20.0		3.0		23.0		do.
	Found.....	21.2	1.2	3.3	.3	23.0	.0	
1170	Guaranteed..	20.0		3.0		23.0		do.
	Found.....	19.1	— .9	3.8	.8	25.6	2.6	
1203	Guaranteed..	20.0		3.0		23.0		do.
	Found.....	20.7	.7	4.2	1.2	23.6	.6	
1197	Guaranteed..	20.0		3.0		23.0		do.
	Found.....	20.0	.0	3.3	.3	24.6	1.6	
1275	Guaranteed..	20.0		3.0		23.0		do.
	Found.....	20.4	.4	3.8	.8	23.2	.2	
1283	Guaranteed..	20.0		3.0		23.0		do.
	Found.....	19.8	.2	3.8	.8	24.1	1.1	
1411	Guaranteed..	20.0		3.0		23.0		do.
	Found.....	16.6	— 3.4	3.2	.2	24.1	1.1	
1162	Guaranteed..	10.0		2.5		40.0		do.
	Found.....	8.9	— 1.1	1.6	— .9	35.6	— 4.4	

MEAL AND PEANUT FEED

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1269	Guaranteed..	18.0		4.3		14.0		Velvet beans ground in the pod (hull and beans ground together).
	Found.....	17.4	— .6	4.3	.0	12.3	— 1.7	
1465	Guaranteed..	19.0		4.5		12.0		do.
	Found.....	17.6	— 1.4	4.5	.0	12.4	.4	
1218	Guaranteed..	18.0		4.5		15.0		do.
	Found.....	18.9	.9	5.6	1.1	9.6	— 5.4	
1256	Guaranteed..	18.0		4.5		15.0		do.
	Found.....	19.5	1.5	5.0	.5	10.1	— 4.9	
1266	Guaranteed..	18.0		4.5		15.0		do.
	Found.....	18.3	.3	4.8	.3	10.9	— 4.1	
1291	Guaranteed..	18.0		4.5		15.0		do.
	Found.....	17.3	— .7	4.3	— .2	12.2	— 2.8	
1214	Guaranteed..	17.3		4.3		14.0		do.
	Found.....	18.5	1.2	4.7	.4	11.3	— 2.7	
1262	Guaranteed..	17.0		4.5		14.1		do.
	Found.....	17.6	.6	4.5	.0	12.7	— 1.4	
1272	Guaranteed..	17.0		4.5		14.1		do.
	Found.....	17.6	.6	4.6	.1	12.6	— 1.5	
1294	Guaranteed..	17.0		4.5		14.1		do.
	Found.....	17.3	.3	4.5	.0	12.8	— 1.3	

VELVET BEAN FEED, PEANUT

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1297	Velvet Bean Feed.....	Peoples Cotton Oil Co., Selma, Ala.	Heyer Bros., Wilmington..	Mar. 9, '17	100	\$.....
	.....do.....	Analysis by Miss. Exp. Sta., Bulletin No. 178.	-----	-----	-----	-----
1250	Peanut Meal*.....	Southern Cotton Oil Co., Wilson, N. C.	H. L. Bizzell, Goldsboro...	Feb. 28, '17	100	2.50
1412	Peanut Feed Meal†.....	.....do.....	Peacock Grocery Co., Wilson.	Mar. 14, '17	100	2.00
1416	.....do.....	.....do.....	Wells Grocery Co., Wilson	Mar. 14, '17	100	2.00
1431	.....do.....	.....do.....	Churchland Feed Co., Kinston.	Mar. 28, '17	100	2.25
1131	Primo Peanut Meal†.....	Sea Island Cotton Oil Co., Charleston, S. C.	H. W. Little & Co., Wadesboro.	Dec. 11, '16	100	2.25
1274	Peanut Kernel and Hull Meal.	Universal Oil Co., Wilmington, N. C.	Pearsall & Co., Wilmington.	Mar. 8, '17	80	2.00

**Peanut Meal or Peanut Oil Meal* is the ground residue after the extraction of part of the oil from peanut kernels. *Peanut Feed or Unhulled Peanut Oil Feed* is the ground residue obtained after extraction of part of the oil from whole peanuts, and the ingredients should be designated as *Peanut Meal and Hulls*.

†The word "*Meal*" does not belong here; should be designated as *Peanut Feed* or as *Unhulled Peanut Oil Feed*.

POULTRY FEED, CRACKED CORN, OATS.

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
1292	Cluck Cluck Scratch Feed	American Milling Co., Peoria, Ill.	McNair & Pearsall, Wilmington.	Mar. 9, '17	100	\$ 3.00
1156	Challenge Poultry Feed ..	Cairo Milling Co., Cairo, Ill.	Merchants Supply Co., Burlington.	Dec. 8, '16	100	2.50
1212	Ajax Scratch Feed.....	Just Mills, Nashville, Tenn.	J. D. Earle Feed Co., Asheville.	Feb. 17, '17	100	2.75
1427	Seaboard Scratch Feed ..	Seaboard Feed and Produce Co., Henderson, N.C.	J. W. Chappell, Creedmoor	-----	50	1.50
1271	Pecaway Chick Feed.....	Southern Feed Co., Newport News, Va.	Hall & Pearsall, Wilmington.	Mar. 8, '17	100	2.75
1209	Superior Poultry Feed.....	Superior Co., Memphis, Tenn.	Adams Grain and Prov. Co., Asheville.	Feb. 16, '17	100	2.75
1136	Tar Heel Dry Mash.....	Tar Heel Mixing Co., Dallas, N. C.	Farmers Supply Co. Dallas.	Dec. 13, '16	25	.80
1235	Cracked Corn.....	Boney & Harper Milling Co., Wilmington, N. C.	B. F. Mitchell, Wilmington.	Mar. 9, '17	75	2.00
1478	.....do.....	Davis Milling Co., Norfolk, Va.	Weldon Grocery Co., Weldon.	May 24, '17	100	3.75
1410	.....do.....	D. P. Reid, Norfolk, Va.	New Bern Hay and Grain Co., New Bern.	Mar. 13, '17	100	2.55

MEAL AND PEANUT FEED—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1297	Guaranteed..	17.0		4.5		14.1		Velvet beans ground in the pod (hull and beans ground together).
	Found.....	17.1	.1	4.4	.1	12.9	1.2	
	Guaranteed..	23.0		7.6				Water, 12.0%; ash, 3.0%; nitrogen-free extract, 48.0%
	Found.....	23.0	6.5	7.6				
1250	Guaranteed..	45.0		6.0		5.0		Ground peanut kernels less the oil extracted.
	Found.....	39.9	5.1	6.8	.8	3.6	1.4	
1412	Guaranteed..	32.0		10.0		20.0		Entire peanut (kernel and hull) less the oil extracted.
	Found.....	33.3	1.3	9.6	.4	18.9	1.1	
1416	Guaranteed..	32.0		10.0		20.0		do.
	Found.....	34.5	2.5	9.1	.9	19.0	1.0	
1431	Guaranteed..	32.0		10.0		20.0		From ground cold pressed peanuts; the entire peanut less the oil extracted.
	Found.....	33.6	1.6	8.9	1.1	18.0	2.0	
1131	Guaranteed..	28.0		8.0		23.0		Peanut kernels and peanut hulls; the whole peanut less the oil extracted.
	Found.....	29.3	1.3	7.6	.4	30.2	7.2	
1274	Guaranteed..	30.0		8.0		24.0		
	Found.....	29.4	.6	8.7	.7	25.4	1.4	

BARLEY FEED AND MISCELLANEOUS

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1292	Guaranteed..	10.0		2.5		5.0		Corn, wheat, barley, Kaffir corn, sunflower seed, oats, buckwheat.
	Found.....	10.8	.8	2.9	.4	2.6	2.4	
1156	Guaranteed..	10.0		3.5		6.0		Wheat, corn, oats, wheat screenings, sunflower seed.
	Found.....	11.3	1.3	2.7	.8	2.4	3.6	
1212	Guaranteed..	9.0		2.5		5.0		Wheat, cracked corn, Kaffir corn or milo maize, barley, sunflower seed.
	Found.....	9.9	.9	3.4	.9	2.4	2.6	
1427	Guaranteed..	10.0		2.5		6.0		Wheat, Kaffir corn, barley, oats, buckwheat, sunflower seed, oyster shells.
	Found.....	10.0	.0	4.0	1.5	1.9	4.1	
1271	Guaranteed..	9.0		2.5		4.0		Wheat, corn, Kaffir corn, milo maize, sunflower seed.
	Found.....	10.7	1.7	4.0	1.5	4.5	0.5	
1209	Guaranteed..	10.0		3.5		4.5		Wheat shorts, wheat bran, corn meal, cotton-seed meal, ground oats.
	Found.....	10.4	.4	3.2	.3	3.2	1.3	
1136	Guaranteed..	15.0		4.0		7.5		Recleaned corn.
	Found.....	15.5	.5	4.3	.3	7.5	.0	
1285	Guaranteed..	8.5		4.0		2.5		
	Found.....	8.7	.2	4.8	.8	1.9	.6	
1478	Guaranteed..	10.0		4.3		3.0		
	Found.....	9.3	.7	3.7	.6	2.2	.8	
1410	Guaranteed..	8.0		4.0		6.0		
	Found.....	9.1	1.1	4.4	.4	1.8	4.2	

POULTRY FEED, CRACKED CORN, OATS,

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed weight of Package-Lbs.	Price of Package
1296	Cracked Corn	Seaboard Feed and Produce Co., Henderson, N.C.	Heyer Bros., Wilmington.	Mar. 9, '17	75	\$.....
1508	Select White Oats, Sulphured.	Magee-Lynch Grain Co., Cairo, Ill.	Marion Cash Feed Co., Inc., Marion.	June 23, '17	---	*.81
1509	do	do	do	June 22, '17	---	*.81
1510	do	do	do	June 22, '17	---	*.81
1099	Barley Feed	Lindsey, Patterson & Co., Roanoke, Va.	Farmers Cash Feed and Seed Store, Winston-Salem	Dec. 6, '16	---	---
1144	Rice Meal	Adler Export Co., New Orleans, La.	Merchants and Farmers Supply Co., Charlotte.	Dec. 14, '16	100	1.85
1432	Malt Sprouts, Barley Hulls and Screenings.	Virginia Feed Milling Co., Alexandria, Va.	Elmore Maxwell Co., Greensboro.	April 28, '17	100	42.00
1401	Diamond Hog Meal	Corn Products Refining Co., New York, N. Y.	John S. McEachern & Sons, Wilmington.	Mar. 10, '17	100	2.65
1234	Buffalo Corn Gluten Feed.	do	Elmore Maxwell Co., Greensboro.	Feb. 27, '17	100	2.35
1146	Meat Meal for Hogs	Armour Fertilizer Works, Chicago, Ill.	Merchants and Farmers Supply Co., Charlotte	Dec. 14, '16	100	3.00

*Per bushel. †Per ton.

MISCELLANEOUS

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
7229	Palmo Meal	Newsome Feed and Grain Co., Pittsburg, Pa.	Sent by the manufacturer	Nov. 27, '16	---	\$.....
7230	do	Golden Grain Milling Co., E. St. Louis, Ill.	do	Nov. 16, '16	---	---
7272	do	Just Mills, Nashville, Tenn.	do	Mar. 9, '17	---	---
7234	Cotton Gin Waste			Dec. 15, '16	---	---
7260	Corn Chaff		C. L. Gilbert, Leicester	Feb. 12, '17	---	---
7263	Peanut Hull Meal		B. Troy Ferguson, Greenville.	Feb. 15, '17	---	---
7460	Rice Hulls	John E. Koerner & Co., New Orleans.	Sent by the manufacturer.	Sept. 9, '17	---	---
7420	Cotton Seed Hull Bran.	American Feed Milling Co., Asheville, N. C.		June 6, '17	---	---
7425	Cocoanut Shells	Clover Leaf Milling Co., Buffalo, N. Y.			---	---
7448	Velvet Bean Hulls	C. G. Hewitt, Montgomery, Ala.		Aug. 15, '17	---	---

BARLEY FEED AND MISCELLANEOUS—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
1296	Guaranteed..	10.0		3.0		10.0		This is commonly sold as malt sprouts.
	Found.....	9.3	.7	3.8	.8	2.3	7.7	
1508	Guaranteed..							
	Found.....	10.8		4.0		10.8		
1509	Guaranteed..							
	Found.....	10.4		4.5		11.2		
1510	Guaranteed..							
	Found.....	10.3		4.8		10.6		
1099	Guaranteed..							
	Found.....	13.3		5.1		11.4		
1144	Guaranteed..	11.0		8.0		11.0		
	Found.....	10.7	.3	10.5	2.5	12.3	1.3	
1432	Guaranteed..	23.0		2.0		13.0		
	Found.....	25.3	2.3	1.1	.9	11.7	1.3	
1401	Guaranteed..	18.0		7.5		13.0		
	Found.....	20.2	2.2	12.3	4.8	8.6	4.4	
1234	Guaranteed..	23.0		1.0		8.5		
	Found.....	28.2	5.2	1.6	.6	8.2	.3	
1146	Guaranteed..	60.0		6.0		2.0		
	Found.....	62.5	2.5	8.9	2.9	1.7	.3	

(UNOFFICIAL)

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
7229	Guaranteed..	7-15		6-10		30-55		Peanut meats and shells and palm oil.
	Found.....	7.1		7.5		58.5		
7230	Guaranteed..							do.
	Found.....	6.9		8.9		52.7		
7272	Guaranteed..							do.
	Found.....	7.0		7.5		55.3		
7234	Guaranteed..	13.3		11-13		29.3		Linters and waste from around cotton gin.
7260	Guaranteed..							
	Found.....	9.0		1.7		14.3		
7263	Guaranteed..							
	Found.....	6.8		2.0		56.4		
7460	Guaranteed..							
	Found.....	2.1		.7		40.5		
7420	Guaranteed..							
	Found.....	2.6		.5		36.4		
7425	Guaranteed..							
	Found.....	15.8		6.0		15.8		
7448	Guaranteed..							
	Found.....	8.0		1.5		21.4		

MISCELLANEOUS

Laboratory Number	Brand Name from Label	Manufacturer or Wholesaler	Retailer	Date of Collection	Claimed Weight of Package-Lbs.	Price of Package
7400	Cotton Stalk Hurds.....	G. M. Schliechter, El Centro, Cal.	-----	May 25, '17	-----	\$-----
7405	Sawdust.....		-----	May 5, '17	-----	-----
7413	Charcoal.....	-----	-----	June 2, '17	-----	-----
7247	Humus.....	Weidener Chemical Co., St. Louis.	Sent by the manufacturer.	Jan. 1, '17	-----	-----
7418	Peat Moss.....	Boston Molasses Co., Boston, Mass.	...do.....	June 13, '17	-----	-----
7417	Xtra-Vim.....	...do.....	...do.....	June 13, '17	-----	-----
7269	Screenings from Motes.....	-----	L. D. Pender, Tarboro.	-----	-----	-----
7446	Soy Bean Hay.....	-----	W. G. Harrison, New Bern, R. 3.	Aug. 4, '17	-----	-----
7283	Coffee Bean Meal.....	Southern Cotton Oil Co., Conetoe, N. C.	-----	-----	-----	-----
7295	Cocoanut Meal.....	Southern Cotton Oil Co., Charleston, S. C.	-----	-----	-----	-----
7285	Malt Sprouts.....	John Gund Brewing Co., La Crosse, Wis.	-----	-----	-----	-----
7461	Oat Clips.....	-----	-----	-----	-----	-----

(UNOFFICIAL)—Continued

Laboratory Number	Guaranteed and Found	Protein, Per Cent	Discrepancy	Fat, Per Cent	Discrepancy	Fiber, Per Cent	Discrepancy	Ingredients Guaranteed
7400	Guaranteed.....	-----	-----	-----	-----	-----	-----	Coarse parts of stalk not usable for fiber-making.
	Found.....	2.6	-----	.4	-----	52.4	-----	
7405	Guaranteed.....	-----	-----	-----	-----	-----	-----	Old field pine sawdust. The "fat" is mostly rosin.
	Found.....	1.1	-----	3.5	-----	63.0	-----	
7413	Guaranteed.....	-----	-----	-----	-----	-----	-----	Peat or humus "passed through about 2,700 degrees of heat." Moisture, 14.0%; Ash, 22.0%.
	Found.....	1.0	-----	-----	-----	-----	-----	
7247	Guaranteed.....	-----	-----	-----	-----	-----	-----	
	Found.....	17.2	-----	.02	-----	-----	-----	
7418	Guaranteed.....	-----	-----	-----	-----	-----	-----	
	Found.....	5.6	-----	3.1	-----	55.0	-----	
7417	Guaranteed.....	-----	-----	-----	-----	-----	-----	
	Found.....	3.9	-----	.6	-----	6.9	-----	
7269	Guaranteed.....	-----	-----	-----	-----	-----	-----	
	Found.....	13.4	-----	7.7	-----	35.0	-----	
7446	Guaranteed.....	-----	-----	-----	-----	-----	-----	Hay left after threshing out the beans.
	Found.....	7.6	-----	2.0	-----	40.8	-----	
7283	Guaranteed.....	-----	-----	-----	-----	-----	-----	
	Found.....	39.1	-----	6.3	-----	11.1	-----	
7295	Guaranteed.....	20.0	-----	6.0	-----	12.0	-----	
	Found.....	21.4	1.4	7.5	1.5	9.8	— 2.2	
7285	Guaranteed.....	-----	-----	-----	-----	-----	-----	Made from dried cocoanut (copra).
	Found.....	31.0	-----	.6	-----	10.8	-----	
7461	Guaranteed.....	-----	-----	-----	-----	-----	-----	
	Found.....	8.2	-----	2.2	-----	19.9	-----	

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CROP ROTATION SYSTEMS ADAPTED TO SECTIONS
INFESTED WITH TOBACCO WILT



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*Assigned by the Bureau of Soils, United States Department of Agriculture.

†Assigned by the Bureau of Animal Husbandry, United States Department of Agriculture.

‡In cooperation with Bureau of Plant Industry, United States Department of Agriculture.

LETTER OF TRANSMITTAL

HON. W. A. GRAHAM,
Commissioner of Agriculture.

SIR:—I submit herewith results of some work in the control of tobacco wilt on the Granville Branch Station farm. The results of these investigations, which were made by Mr. E. G. Moss, Assistant Director of this station, and Dr. F. A. Wolf, Plant Pathologist of the Experiment Station, show that wilt can be satisfactorily controlled by a system of cropping or rotation in which tobacco is not grown on the infested fields for a period of years. I recommend that this paper be published as the December BULLETIN.

Very respectfully,

B. W. KILGORE,
Director, Test Farms.

Approved for printing:

W. A. GRAHAM,
Commissioner.

CROP ROTATION SYSTEM ADAPTED TO SECTIONS INFESTED WITH TOBACCO WILT

By

E. G. MOSS,* ASSISTANT DIRECTOR OF TOBACCO STATION,
and

FREDERICK A. WOLF, PLANT PATHOLOGIST, NORTH CAROLINA AGRICULTURAL
EXPERIMENT STATION.

For a number of years, growers of tobacco have annually suffered more or less serious losses from a disease commonly known as tobacco wilt. The studies which have been made to determine a satisfactory means of control of this disease have demonstrated that none of the native or foreign varieties of tobacco or any strains secured by crossing them possess any marked resistance to the disease. These studies have furthermore demonstrated that the use of chemicals and fertilizers are without beneficial effect in wilt control. It has been found, however,



Fig. 1. A field of Tobacco over 50 per cent of which died from wilt.

that this wilt disease can be very satisfactorily controlled by the employment of certain systems of cropping or rotation in which tobacco is not grown on the infested fields for a term of years. A recent bulletin† calls attention to these results but does not outline specific rotation systems to be followed nor does it emphasize the fact that several species of cultivated plants and weeds are attacked by the wilt germ, which fact has an important bearing upon the problem of tobacco wilt control. This

*In accordance with an agreement between the North Carolina Department of Agriculture and the Bureau of Plant Industry of the United States Department of Agriculture, E. G. Moss has assisted in preparing this circular.

†The Control of Tobacco Wilt in the Flue-cured District. U. S. Dept. of Agr. B. P. I. Bul. 562. 1-20, 1917.

bulletin is therefore prepared to supply this important information to growers of tobacco in wilt-infested areas. It is particularly applicable to the area included in the circle on the map (front page), where the disease is generally prevalent although wilt is known, in addition, to be present sparingly in the counties of Ashe, Guilford, Davidson, Yadkin, Chatham, and Greene.

EFFECTIVENESS OF CROPPING AND ROTATION TESTS.

It is believed that the suggestion of definite systems of rotation can best be made after results have been briefly presented showing the value of the employment of rotation systems. The field on which all these experiments were made was badly infested with tobacco wilt, since about 75 per cent of the tobacco died the year before these experiments were started. The data upon which these results are based were secured at Creedmoor, N. C. The infested field in which the tests were made was appropriately divided into plots of one-fourth acre, each of which was cropped differently. The results of a five-year cropping system are shown in Table I.

TABLE I. FIVE-YEAR CROPPING AND ROTATION TESTS AT
CREEDMOOR, N. C., IN 1916.

Name of Plot.	Percentage of wilt.
Rotation Plot A. (Corn, wheat, corn-clover and mixed grasses, clover and mixed grasses, tobacco) -----	10.9
Plot B. (Sweet potatoes continuously) -----	21.2
Plot C. (Peanuts continuously) -----	57.7
Plot D. (Corn continuously) -----	3.7
Plot E. (Red clover and mixed grasses continuously) -----	4.9
Plot F. (Wheat and cowpeas continuously) -----	6.0
Plot 1B. (Tobacco continuously) -----	81.3

It will be seen from this table that over 80 per cent of the plants showed wilt where the land was cropped to tobacco each year. Most of the wilt in rotation Plot A occurred in a poorly drained corner, and in Plot B, only 5 per cent of wilt was present when the tobacco was mature, whereas, when it was harvested, two weeks later, 21 per cent of the plants were affected. Peanuts are subject to wilt, which accounts for the large amount of disease on Plot C. In general, therefore, barring Plot C, there was about 5 per cent of wilt on the several five-year test plots as compared with 80 per cent on the one devoted to continuous cropping with tobacco. Since it is important to learn the shortest practicable rotation for controlling tobacco wilt, a certain plot was planted to crops other than tobacco for three years, another for four years, another for five years, and another for six years. These results are assembled in Table II.

TABLE II. TESTS TO DETERMINE LENGTH OF ROTATION.

Name of Plot and year	Crops planted in previous years	Percentage of wilt	
		In rotation Plot	In check Plot
Rotation Plot 2A, 1914	{ Corn 1911, wheat 1912, clover and mixed grasses 1913, tobacco 1914. }	12.6	53.0
Rotation Plot 3A, 1915	{ Corn 1911, wheat 1912, corn 1913, clover and mixed grasses 1914, tobacco 1915. }	18.9	72.0
Rotation Plot 4A, 1916	{ Corn 1911, wheat 1912, corn 1913, clover and mixed grasses 1914, clover and mixed grasses 1915, tobacco 1916. }	10.9	81.0
Rotation Plot 2B, 1917	{ Corn 1911, wheat 1912, clover and mixed grasses 1913, corn 1914, wheat 1915, clover and mixed grasses 1916, tobacco 1917 }	2.3	97.6

Less than 5 per cent of wilt was present in 1915 at the time when the tobacco was ready to harvest and, as has previously been explained, much of the wilt in Plot 4A occurred in a poorly drained corner. It is, therefore, evident that a good crop of tobacco with not over 5 per cent loss from wilt can be grown every fourth or fifth year even on badly infested land.

Since cotton has not been employed in any of the systems of rotation reported, a test was made of the effect of planting cotton for four successive years before returning the land to a crop of tobacco. The results are presented in Table III.

TABLE III. CONDITION OF TOBACCO IN 1917 ON PLOT CONTINUOUSLY CROPPED WITH COTTON AS COMPARED WITH ONE CONTINUOUSLY CROPPED WITH TOBACCO.

Name of Plot	Percentage of Wilt
Plot 1A. (Cotton continuously) -----	5.2
Plot 1B. (Tobacco continuously) -----	97.6

Wilt was generally very severe in 1917 as indicated by the fact that Plot 1B was practically a total loss. The results of this test indicate that cotton may safely and advantageously be employed in a rotation system on wilt-infested lands.

Attention should also be called to the fact that, whatever system of rotation is adopted, wilt-infested land must not be left to grow weeds or to "lie out" as is the practice with some farmers. These weeds not only seed the land and are thus troublesome to the succeeding tobacco crop, but many of them harbor the wilt germ. It has been found that both rag weeds and horse weeds, which are the most common weeds on fields left to lie out, harbor the wilt germ. Other species of weeds, such as jimson weed, ground cherries, croton, horse nettle, and eclipta, are more

or less common in tobacco lands and all harbor tobacco wilt. The growth of the germ on these weeds accounts for the prevalence of wilt on lands which have not been tilled for a year, and, in part, for the occurrence of wilt on new land. Then, too, the fact is not generally appreciated that Irish potatoes, tomatoes, peppers, peanuts, and velvet beans are all subject to the same disease. These crops must not, therefore, be grown on fields immediately before or after planting to tobacco.

CROP ROTATION SYSTEMS.

There is no more important matter for the tobacco grower to consider than the management of his fields so that they will be in the best shape for tobacco at the proper time. In fact, the quality of the tobacco produced depends quite as much upon how the fields have been handled in rotation between successive crops of tobacco as upon the fertilizer used or the cultivation given directly to the tobacco crop itself. This proper management of the fields becomes doubly important when it becomes necessary to control tobacco wilt. Further, growers have not fully appreciated the necessity of adopting some definite rotation system and adhering to it where this dual purpose must be met. To meet this need, therefore, several systems are suggested, some of which require four years, some five, and some six, between crops of tobacco.

ROTATION 1.

First year—Tobacco, followed by fall sowing of oats and vetch or rye and vetch for seed.

Second year—Soy beans or cowpeas, sown after harvest, followed in fall by rye or crimson clover (to be plowed under the following spring).

Third year—Cotton, followed by rye in fall.

Fourth year—Tobacco.

This rotation is suggested for land that is only slightly infested with wilt. It is too short a rotation to be used on fields that are badly infested, and therefore is not recommended in such cases.

Virginia Gray or Turf oats or Abruzzi rye should be seeded with hairy vetch, as they will mature seed about the same time as the vetch. If this crop is grown for market the vetch seed can be separated from the rye or oats. If not, this is a good combination to sow for soil improvement or for hay. In subsequent rotations where vetch is recommended as a cover crop to be plowed under, consideration should be given to the fact that the cost of seeding an acre with vetch is about twice as great at present prices as when crimson clover is used as a cover crop. If either of these crops is permitted to mature a crop of seed, however, a good cover crop will appear during the following fall and winter from the seed which have shattered at time of harvesting.

Soy beans or cowpeas can be used as a money crop if the acreage planted is sufficient to justify the purchase of a harvester. Otherwise, they may be cut for hay or be plowed under as a soil-improving crop,

which will pay in the following cotton crop. On the thin tobacco soils in the wilt area, tobacco will do well after cotton.

ROTATION 2.

First year—Tobacco; in fall oats and vetch or rye and vetch or crimson clover, to be plowed under.

Second year—Corn, rye, and vetch, crimson clover as a cover crop, plowed under.

Third year—Corn, rye in fall.

Fourth year—Tobacco.

Rotation 2 is objectionable because corn precedes tobacco, and usually it is difficult to get tobacco to grow large enough after corn unless stable manure can be used under the tobacco. Wire worms frequently cause trouble, too, as they winter in the corn stubble.

ROTATION 3.

First year—Tobacco, with fall-sown crimson clover or vetch.

Second year—Corn, followed by crimson clover or vetch.

Third year—Cotton, with fall-sown rye to be plowed under.

Fourth year—Tobacco.

Rotation 3 is preferable to No. 2 as cotton precedes tobacco and is not so exhaustive a crop as corn. Besides, this rotation gives two money crops in three years.

ROTATION 4.

First year—Tobacco, followed by Abruzzi rye, wheat or oats.

Second year—Soy beans, Abruzzi rye, wheat or oats (cowpeas).

Third year—Grass mixture.*

Fourth year—Grass mixture.

Fifth year—Tobacco.

ROTATION 5.

First year—Tobacco.

Second year—Grass mixture, sown in fall after tobacco.

Third year—Grass mixture; break sod in fall or winter.

Fourth year—Cotton, with rye in fall.

Fifth year—Tobacco.

Rotations Nos. 4 and 5 are excellent ones to use provided the land is not badly infested with wilt. It must be remembered that in no case where the land is badly wilt-infested, should tobacco be planted oftener than once in five or six years. However, after the wilt has been reduced, a somewhat shorter rotation may be used.

*Italian rye grass.....	5 pounds
Red top or herds' grass.....	5 pounds
Orchard grass.....	5 pounds
Tall meadow oat grass.....	5 pounds
Red clover.....	6 pounds
Alsike clover.....	4 pounds

30 pounds

Rotation 4 is suggested for growers who have plenty of corn land and do not wish to grow corn on any of their tobacco land. In Rotation 5, cotton precedes tobacco as cotton matures so late in the fall that the grass mixture can not be seeded early enough to insure a good stand.

A grass sod is one of the best crops to precede a tobacco crop, as it adds organic matter to the soil. It is necessary to keep the weeds down on this sod by running the mower over the grass two or three times during the summer, even if it is not tall enough to yield much hay.

The clover added in this grass mixture will not cause any serious trouble to the tobacco, as a large percentage of it will die out after the first year and even if the clover is present, the tobacco can be planted closer, topped higher and harvested by prining, thereby preventing to a large extent, the rough, coarse tobacco that usually follows a legume crop.

The grass mixture suggested will make fair yields on tobacco soils in the wilt section provided lime and fertilizer are used.

ROTATION 6.

First year—Tobacco, followed by wheat or oats.

Second year—Cowpeas or soybeans as summer crop, rye for cover crop.

Third year—Cotton, rye or clover in fall.

Fourth year—Cotton, followed by rye.

Fifth year—Tobacco.

In rotation 6, corn can be substituted in the third year for cotton but it is doubtful if the crop of cotton in the fourth year will be as good as it would be by having cotton on the land both years.

ROTATION 7.

First year—Tobacco, crimson clover as cover crop.

Second year—Sweet potatoes, fall-sown wheat or Abruzzi rye for seed.

Third year—Soybeans for seed, rye in fall to be plowed under.

Fourth year—Cotton, rye in fall.

Fifth year—Tobacco.

Rotation 7 would be an excellent one to follow especially in the Creedmoor section where wilt is most serious, provided community potato houses could be built for storing the potatoes in order to market them after Christmas. It is not unusual for farmers to grow two or three hundred bushels of marketable sweet potatoes per acre in that section, and there is always a good demand for potatoes after the holidays. The increased planting of the crops suggested in this rotation would give four money crops, all of which can be grown profitably. In addition, hogs can be employed in utilizing the sweet potatoes left after digging and in harvesting the soy beans.

ROTATION 8.

First year—Tobacco.

Second year—Wheat or oats, soybeans or cowpeas.

Third year—Grass mixture.

Fourth year—Grass mixture.

Fifth year—Corn, rye put in to be turned under in spring.

Sixth year—Tobacco.

ROTATION 9.

First year—Tobacco, followed by crimson clover or vetch plowed under.

Second year—Corn.

Third year—Wheat or oats, soybeans or cowpeas, followed by grass seeded in fall.

Fourth year—Grass mixture.

Fifth year—Grass mixture.

Sixth year—Tobacco.

In rotation 8, corn precedes tobacco and can be used on land that is too rich to grow good tobacco after having been in the grass mixture for two years. Most of the tobacco land in the wilt section needs more nitrogen and organic matter however, and it is very probable that rotation 9 will give better results.

ROTATION 10.

First year—Tobacco, with crimson clover or vetch in fall.

Second year—Corn, with cover crop of crimson clover or vetch.

Third year—Cotton, followed by crimson clover or vetch.

Fourth year—Corn, cover crop of vetch or crimson clover.

Fifth year—Cotton, with rye in fall.

Sixth year—Tobacco.

Rotation 10 is a good one, and can be used with good results provided the cover crops are put in every year and plowed under in the spring. If this is not done, the main crops, being clean cultivated crops, will soon render the land so infertile that a profitable tobacco crop can not be grown.

ROTATION 11.

First year—Tobacco, with oats and vetch or rye and vetch sown in fall.

Second year—Harvest fall crop for seed and follow with summer crop of cowpeas or soybeans either for seed or hay. Fall-sown wheat, oats, or Abruzzi rye for seed.

Third year—Soybeans or cowpeas to succeed the wheat, oats, or rye. Rye and vetch, vetch or crimson clover to be turned in spring.

Fourth year—Corn, with rye and vetch or crimson clover in the fall.

Fifth year—Cotton, with rye in fall.

Sixth year—Tobacco.

Rotation 11 has two small grain crops, the first, oats and vetch or rye and *vetch* to be harvested for seed. The *vetch* is a legume crop and can be harvested with the rye and oats for seed. This will insure an abundance of legume seed for the farm and possibly some for market. The second year wheat, oats, or Abruzzi rye can be planted alone for

seed, if desired, or the vetch can be added as is done the first year. There will undoubtedly be an increasing demand for vetch seed for a number of years, and they can be easily grown in combination with one of the small grain crops.

In all of the rotations suggested in this circular, the relation of other crops to tobacco and also the effect the crops other than tobacco have on the control of this tobacco wilt have been kept in mind. It is essential that all land infested with wilt be kept free from weeds, and in planning these rotations, the authors have tried to suggest combinations of crops that are entirely practical and that may be used in such a way as to prevent the land from growing a crop of weeds at any time. It is also suggested that the grower select the rotation that may be adapted to his conditions and adhere to it, and if he should have a field on which only a few plants die from the wilt, after he has followed his rotation for a number of years, it is not advisable to plant this field to tobacco again until he has followed the cycle of rotations with which he started.

It is doubtful if the wilt germ will ever be entirely eradicated from the soil after it is once infested, but it can be controlled to such an extent that tobacco can be grown with only a small percentage of loss.

LEAF TOBACCO REPORT FOR DECEMBER, 1917

Pounds sold for producers-----	15,411,027
Pounds sold for dealers -----	740,718
Pounds sold for warehouses-----	1,140,564
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Total-----	17,292,309

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